L 1 61 FIFTY CENTS

# The Farm
## QUARTERLY

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JUL 27 1961
HOME READING

## Storing Wet Corn in a Pit Silo
## NFO and its Marketing Contracts

See how it works on the gauge...

Prove it with a fuel test...

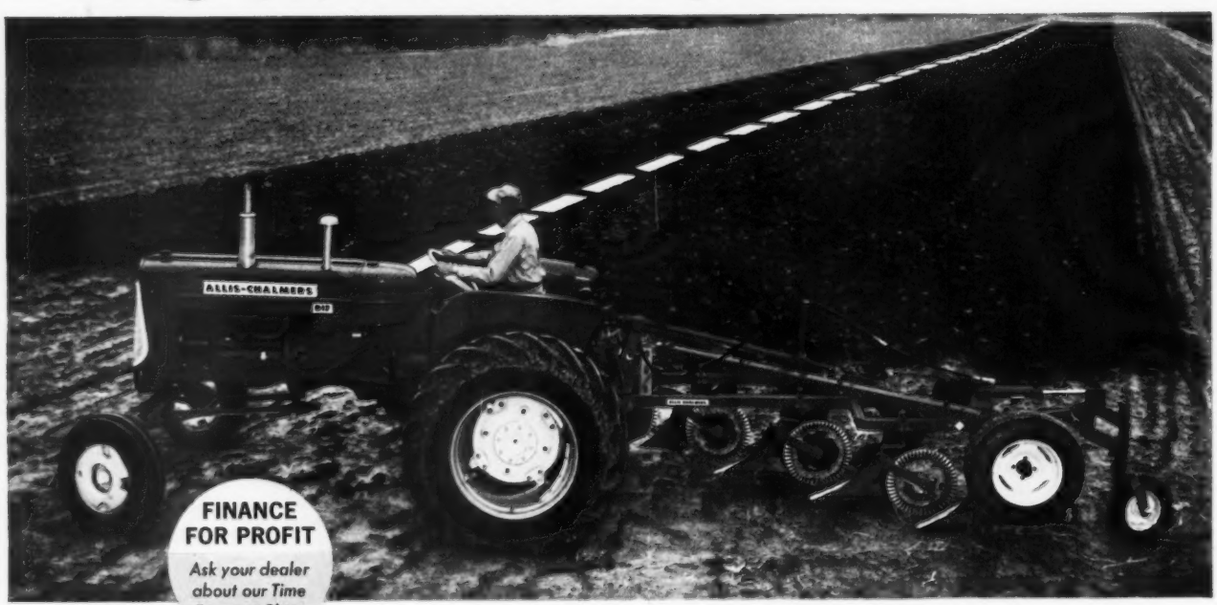
# up to 1/3 MORE WORK

Your Allis-Chalmers dealer will demonstrate in the field . . . for you . . . *why* a new D Tractor does up to 1/3 more work than your present tractor on the same amount of fuel. You'll see why the TRACTION BOOSTER system keeps you on-the-go . . . adding weight automatically when the going gets tough . . . releasing weight to save fuel as the load lightens.

Across the country, many new D Tractors are working from 25 to 45 percent more land than other tractors on the same amount of fuel. Your Allis-Chalmers dealer will give you a proof-test in the field. Also, he will prove the dollar-making difference of these other tractor features: Power Director (The Big Stick), SNAP-COUPLER hitch, Power-Shift rear wheels, and Roll-Shift front axle. You'll find out how you can save money . . . and farm faster and easier than ever before.

ALLIS-CHALMERS,
FARM EQUIPMENT DIVISION, MILWAUKEE 1, WIS.

## with new D Tractors
### using 2, 3, 4 or 5-bottom plows




TRACTION BOOSTER and SNAP-COUPLER are Allis-Chalmers trademarks

Get the dollar-making difference with **ALLIS-CHALMERS**

GOODYEAR "EXTRA HAND" SERVICE AT WORK

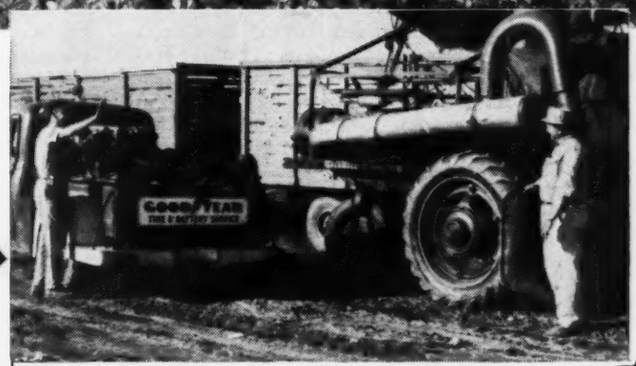
# "I'd have lost at least $1,700 without their Sunday service"

*—says R. D. Peck, Valley Harvesters, Fresno, California*

1. **YOU'RE LOSING MONEY EVERY MINUTE** when you're a professional harvester with equipment trouble. So when a cotton picker blew a tire one Sunday morning, Manager R. D. Peck immediately radioed the farm's headquarters for help.

2. **WITHIN MINUTES OF THE TROUBLE-CALL** relayed from the farm, Corcoran Implement Company's assistant manager, Dick Bondurant and his aide, Fred Gresham, arrived at the field and got to work. A quick tire change is easy for these experts with their fully equipped repair truck—complete with a free "loaner" that pinch-hits whenever a tire must go back to the shop for repairs.

3. **ONLY 30 MINUTES AFTER THE BLOWOUT,** Valley Harvester's picker is going back to the field. "We lost only half a bale. But we could have lost 12 bales, had the picker been laid up all day," says Peck. "So Corcoran's quick service—on a Sunday, too—saved us from a loss of at least $1,700!"




**ANOTHER BIG BENEFIT** of "Extra Hand" service: the superior performance and bonus service-life of Goodyear's famed Sure-Grip Tractor Tires with their super-tough rubbers—exclusive Triple-Tempered Cord "muscles"—ground-gripping, gearlike tread.

It's one of many reasons why you, too, will be time and money ahead by calling your Goodyear dealer next time. Goodyear, Farm Tire Department, Akron 16, Ohio. Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

**GOODYEAR "EXTRA HAND" FARM TIRE SERVICE**

1 Check, change and repair any type tire.
2 Furnish free "loaners" while your tires are being repaired or retreaded.
3 Liquid-weight your tractor tires for maximum traction.
4 Minimize down time through expert help on tire maintenance.
5 Take care of your battery needs.

Lots of good things come from

# GOODYEAR

**MORE FARMERS PREFER GOODYEAR TRACTOR TIRES THAN ANY OTHER KIND**

*Choose either the popular 3-T Sure-Grip or extra-quality Traction Sure-Grip tires, both out-in-front performers*

*Every arrow points to a lake or pond on an Iowa Watershed. Cumulatively these ponds trap millions of gallons of water and help control erosion.*

*Data and photos from The Des Moines Sunday Register*

# Watershed Program pays Iowa Many Benefits

*Floods eliminated, top soil saved, yields increased, property values boosted—these are just a few of many benefits of Iowa's Watershed Program*

Ever since the plow first turned virgin Iowa prairie, heavy rains have meant flooding, loss of topsoil, destruction of property, hardships, and even loss of lives.

Today, cooperative efforts of Iowa farm and townspeople and Soil Conservation Service are helping curb the floods. Six watershed developments have been completed in Iowa; seven more are in the construction stage, 10 are in planning, and 21 others have been approved by the state soil conservation committee.

These jobs call for moving millions of yards of earth, clearing thousands of acres of land, smoothing over hundreds of gullies and building miles of terraces—and Cat-built equipment has helped the work succeed.

### Iowa Watersheds passed the test

The spring of 1960 was a tough test for watersheds in Western Iowa. Heavy snow accumulations were followed by high intensity spring rains. In the Wolf Creek subwatershed with only 26% of the area protected, water was effectively controlled.

Even following a 7 inch rain, with 4 inches falling in thirty minutes, there was no flooding in the town of Anthon—where it was estimated that damage would have cost $100,000! Yet, only a few miles away in the West Fork subwatershed of the same project, with very little of the area protected, the town of Hornick was under a foot of water.

### Entire communities benefit

Not just the farms and villages in the flood areas benefit from protected watersheds. Dams often do double duty, and serve both as flood retarding structures and bridges, saving thousands of tax dollars in initial cost and upkeep. Such a dam and the bridge it replaced in Iowa's Little Egypt Watershed is shown below.

Iowa folks realize many "bonus benefits" from the watersheds. Their upstream practices of terracing, contour farming and strip cropping retard water run off and check erosion, reduce soil losses 50% to 90%, and increase yields as much as 10%. Their ponds impound water, and at the same time provide a water supply for livestock, domestic use and irrigation. Frequently an attractive lake is created from an eyesore gully. Farm values also increase when flooding danger is eliminated.

### You can share in watershed benefits, too

Does your neighborhood or your farm have flooding and serious erosion problems? It will pay you to learn more about the possibilities of soil conservation and a Watershed Program from your Soil Conservation Service. You can make an important beginning right on your own farm—today! You'll find a Cat farm Tractor ideal for all land clearing, earthmoving and conservation jobs, as well as your general farm work. See your Caterpillar Dealer for more information.

*BEFORE work done in Little Egypt Watershed.*

*AFTER dams were built, the erosion was halted.*


CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Caterpillar Tractor Co.
General Offices, Peoria, Ill., U.S.A.

IT'S A MARTIN!

# HI-STOR
## WET CORN STORAGE

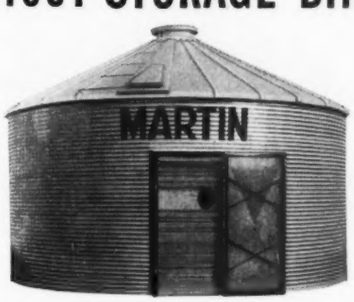
GIVES YOU MORE!

- *more* crop harvested
- *more* feeding value
- *more* potential profit

There are real advantages in storing and feeding high-moisture shelled corn, in a Martin Hi-Stor:

- Lifetime galvanized, heavy steel construction
- Bottom auger unloading for ease and efficiency
- Tight seal built into every wall and roof joint
- "Man-size" manhole
- Practical lifeguard ladder
- Regulator valve for pressure equalization

## 1961 STORAGE BIN




## For Dry Storage of all Grains And Shelled Corn

- Pressure sealing against driving rain and snow at both the eave and roof cap areas is available.
- Massive 1-piece, welded, galvanized door frame. Extra wide, too.
- Foot-for-foot it has stronger walls.
- "Man-size" ridge opening for easy access, filling and aeration.
- Both hatch door and vent can open and close from the ground.
- Sizes from 500 to 15,325 bushels.

**MARTIN STEEL**
913 Longview Avenue • Dept. FQ-7 • Mansfield, Ohio

Please send information promptly.

Name _____

Address _____

City & State _____

# The Farm
## QUARTERLY

*Fall 1961, Vol. 16, No. 3*

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THE FARM QUARTERLY
*22 East Twelfth Street, Cincinnati 10, Ohio*

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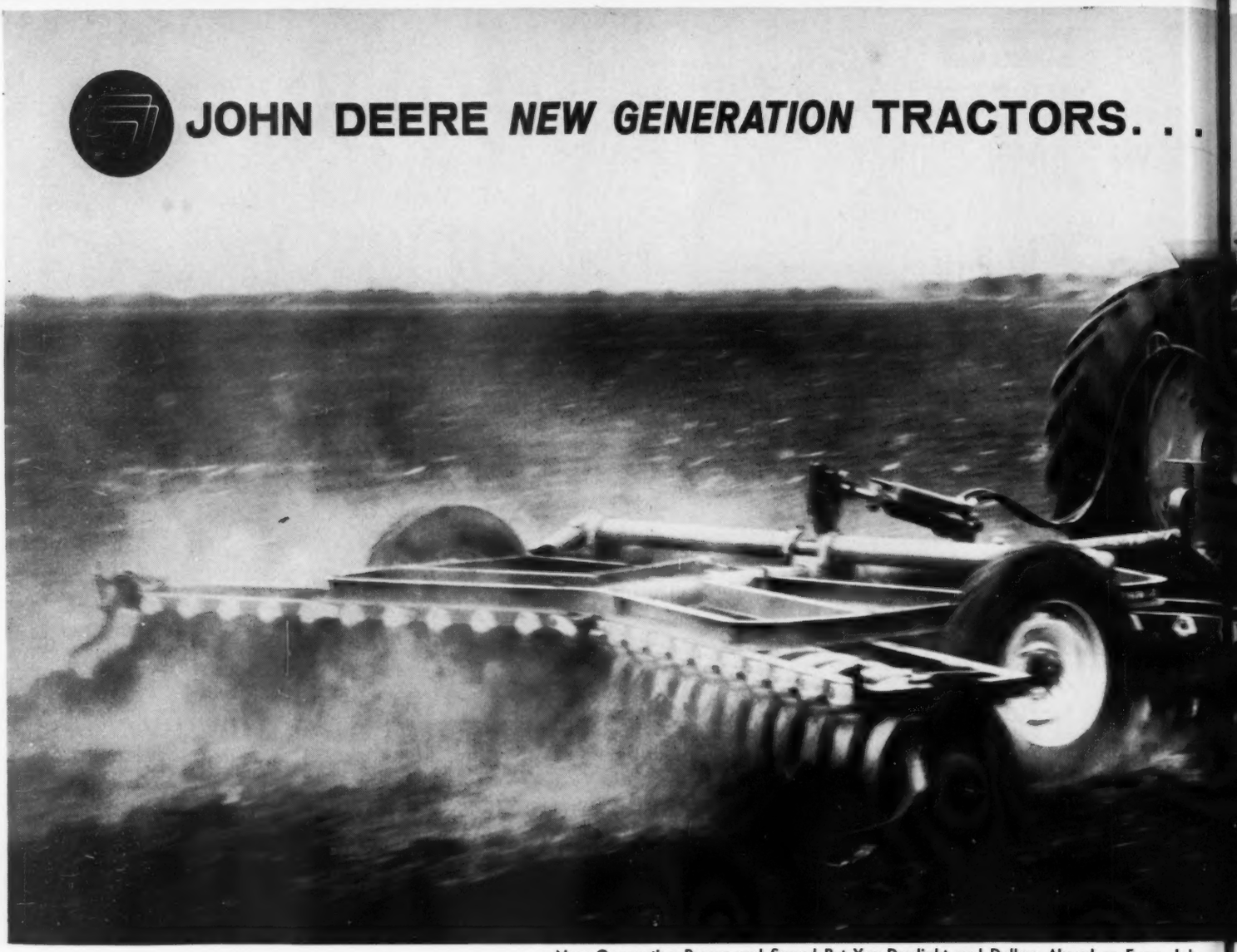
# JOHN DEERE *NEW GENERATION* TRACTORS. . .

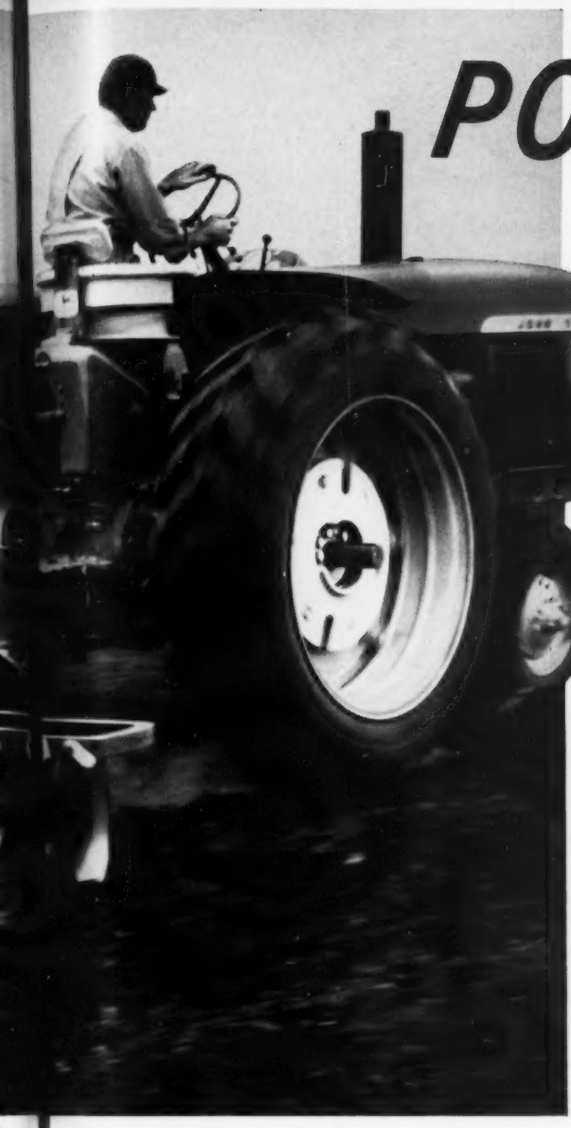


New Generation Power and Speed Put You Daylight and Dollars Ahead on Every Job.

## There's a power size, model, and fuel-type to

**Three NEW Row-Crop Utilities** Low, compact, stable; yet, with ample crop clearance to handle two- and four-row cultivators—these are advantages you'll find in new John Deere Row-Crop Utility Tractors. You can choose from the 35 h.p. "1010" Series (above), the 45 h.p. "2010" Series, and the 55 h.p. "3010" Series. Gasoline and Diesel engines; LP-Gas, too, in the two larger sizes.

**Three NEW Row-Crops** Fast-working power fo every farm job, plus complete adaptability to every crop require ment is yours in the new line of John Deere Row-Crop Tractors Pick the size that fills your needs—the 45 h.p. "2010" Series (above), the 55 h.p. "3010" Series, or the 80 h.p. "4010" Series There's a complete fuel option—gas, Diesel, or LP-Gas—plus a choice of front-end assemblies to match your row spacing.



# POWER TO RUN where others walk

When all is said and done, the true measure of a farm tractor is in its ability to increase daily work output and hold operating costs down. John Deere New Generation Tractors set the pace in this direction—"running" rather than "walking" through big jobs. These tractors are designed to pull their loads at higher speeds; to work more acres per day. Further, they operate at the exact speed you want in the gear range that offers the greatest economy.

The days of the heavy cumbersome "weight lifter" tractor are numbered as are the hours spent slugging out a heavy job at a snail's pace. Today comes a new concept of power—fleet, agile John Deere Tractors that move loads in the more-efficient, practical, and economical work gears. And when the heavy tillage work is over, these same fast-working John Deere Tractors are far better suited to handling the remaining 70 to 80 per cent of the farm work. On both sides of the ledger—work completed or reduced operating costs—you'll write in black ink in the John Deere column.

Ask your John Deere dealer for a free demonstration of this new power concept and the many other advanced features in the New Generation of Power Tractors.

## to meet your exact farming requirements...

**Two NEW Standards** Husky power ideally suited for grain and rice growers is provided in the new 55 h.p. "3010" and 80 h.p. "4010" Standard Tractors. Gas, Diesel, and LP-Gas engines are available in both series. A short wheelbase, wide rear fenders, and a husky oscillating front axle tailor these tractors to grain and ricefield work. Both tractors can be equipped with a 3-point hitch for "pick up and go" farming at its best.

### Horsepower IS as horsepower DOES

*New Generation Tractors are designed to pull their loads at higher speeds . . . work more acres every day!*

*These tractors operate at the speed you want in the gear range that gives you maximum economy!*

**JOHN DEERE**
**design, dependability, and dealers**
**MAKE THE DIFFERENCE**

JOHN DEERE

**SEND FOR FREE LITERATURE**

JOHN DEERE • 3300 RIVER DRIVE, MOLINE, ILLINOIS

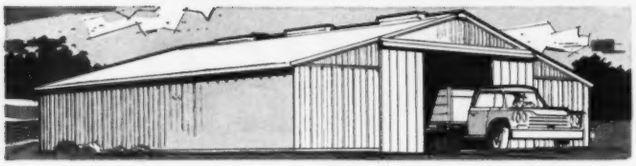
Please send information on these tractors:

- ☐ 4010 & 3010 Row-Crop
- ☐ 2010 Row-Crop & Utility
- ☐ 1010 Row-Crop Utility
- ☐ 4010 & 3010 Standard
- ☐ 1010 Single-Row & Utility
- ☐ 1010 Agricultural Crawler

*Name*_____ ☐ *Student*

*Rural Route*_____ *Box*_____

*Town*_____ *State*_____



**Armco Drainage & Metal Products, Inc., 6911 Curtis Street, Middletown, Ohio**

Send me information about Armco Buildings for the following uses:_____

☐ RUSH—Have dealer call! Phone_____

NAME_____

STREET_____

CITY_____ COUNTY_____

STATE_____ ☐ Owner ☐ Tenant ☐ Student

# Not quite ready . . . but his Armco Building IS

When his grain matures, this farmer is prepared to protect it in a durable, weathertight Armco Grain Storage Building and to increase his profits with higher spring prices. Built to withstand the most severe weather and storage conditions, easy-to-maintain Armco Steel Buildings are available in an almost unlimited choice of sizes. They meet all requirements of government loans and reseal programs.

Steel

For strength, economy, durability

Find out how easily these rugged buildings can fit into *your* plans. If you need a building immediately, check the "RUSH" box in the above coupon, then mail coupon to **Armco Drainage & Metal Products, Inc., subsidiary of Armco Steel Corporation, 6911 Curtis Street, Middletown, Ohio.**

ARMCO **Drainage & Metal Products**

# OLIVER 1800 PULLS UP TO 57% MORE

You get pulling power in the new Oliver 1800—not just horsepower. In nationally recognized tests, the 1800 Row Crop® diesel pulled up to 57% more than other tractors in its class—11,040 pounds on the drawbar. And the gasoline 1800 walked away with 10,619 pounds.

That's only half the story. The 1800 set an *all-time* gasoline economy record. Here's proof of its thriftiness—in a big way. Teamed with a 6-bottom, semi-mounted No. 5540, it plowed 3.38 acres of Iowa silt loam 7 inches deep in an Oliver-supervised, one-hour test. Fuel cost was only 29½¢ per acre.* This is balanced power—smooth 6-cylinder horsepower matched to more than 4 tons of basic, built-in weight. It gives you ground-gripping traction without fuel-wasting slippage.

Here's the combination that's setting new marks in plowing speed and quality—an example of coordinated Oliver engineering. An exclusive, pivoting drawbar—pulling the plow from a single post at front center to relieve side draft—also controls the tailwheel, swings it into any turn the tractor makes. You can narrow headlands to 20 feet, maneuver in close quarters easily.

Make your working hours pay more with an Oliver 1800. Power steering is standard Row Crop equipment. A cushioned, rubber-spring seat provides easy-chair comfort. Patented, touch-button "Hydra-lectric" system offers on-the-go control of working depth. Operating conveniences include draft-sensitive, standard 3-point hitch and dual-speed PTO. Oliver Corporation, Chicago 6, Ill.

**Based on national average gasoline cost of 19¢ per gallon.*

SEE YOUR

**OLIVER**

DEALER

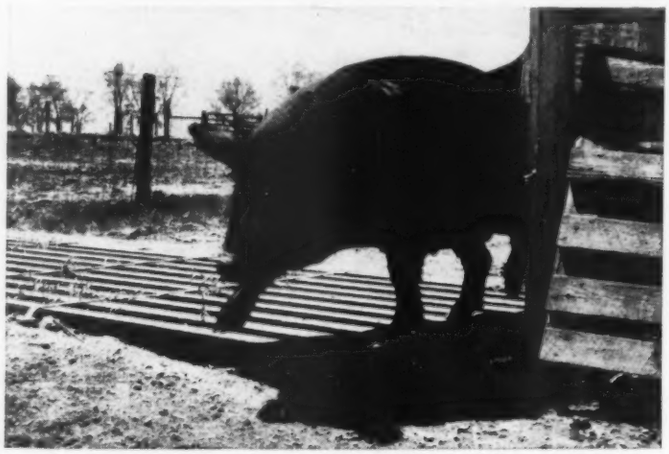
OLIVER

**Look for this sign, new symbol of prompt, dependable service and genuine Oliver parts.**

# To Begin With

**Beating the Slats** A couple of years ago, a university researcher made the statement that the hog was the smartest domestic animal, a statement which, he said, "has caused me considerable trouble since." Trouble was, it seems, dog lovers and horse backers and cat carriers didn't agree.

So up comes a sow on the Monte Sink farm, near Indianapolis, Indiana, showing hogs to be at least one up on cattle and horses. This sow has a way across a cattle guard. She leans against the side of the fence for support, and hooks her dewclaws over the slats. She can make it both ways, slowly, but with ease. She has her run of the barn (and the spilled feed therein.) "She thinks she's people" said Sink.



**First-Class Concrete** One of the questions that raises its ugly head in the aftermath of printing the proper way to place and cure concrete (Winter, '60-61) is "How do you tell if you did the job properly?"

The proof, of course, may take quite a while to show. Badly laid concrete may not flake or crack for a couple of years. But there is a quick test which helps to check the job. When the concrete has cured (14 days) take off the covers and let the surface dry. Then wet it with clean water and examine the surface as the water starts to run off. Badly cured concrete will show a fine network of spider-web cracks crisscrossing over the surface. A good job won't show any.

Another term you may not have heard is "slump." It's a measure of the water in concrete. Slump is measured by putting some newly-mixed concrete in a special conical container, called a slump cone. The cone is 12 inches high, 4 inches in diameter at the top, 8 inches at the bottom. You fill it through the small end. Lift off the container, and the concrete slumps. This slump is measured in inches—how far the concrete has slumped down from the point of the cone. No concrete should be used which has more than two-inch slump. Yes, you're right, it's much harder work to handle and level this drier concrete, but for a lasting job, it's the only way. Incidentally, some of the new Federal Highway contractors are using concrete that's as sloppy as buttermilk. And that, Sir, is going to spell trouble one of these fine frosty days in a year or two. You'd think the Feds wouldn't let any slump get away from them.

**Let's Picket** "The farmer receives about 2½ cents for the wheat in a 25-cent loaf of bread, and less than a dollar for the cotton in a fifty-dollar suit." *News Item*

Is it futile
To till,
From year to year,
While the grocer and the haberdasheer
Sell fiber and food that we wring from the soil
And ring up their till with most of the spoil?

Couldn't Congress,
Or Bureau,
Or Union or Grange
Foster some planning for planning a change
To pass to the farmer just *some* of the loot
That's made from bread or a business suit? J.J.M.

# Farm Books

***Farm Building Design,** by Loren W. Neubauer and Harry B. Walker, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1961. $13.00*

This is an excellent book for the man who is designing a structure. It contains good chapters on the characteristics of wood, steel, masonry, their use and properties. It describes the use of trusses, foundations, frames, posts and other construction members. But the book is miserable on layout of buildings—as opposed to construction. For example, the chapter on dairy doesn't mention the herringbone layout, and the chapter on farm wiring suggests a 100-amp service might be sufficient for a modern farm. It wouldn't come close under today's conditions. And the book doesn't mention tilt-up concrete. With these restrictions, it has its place.

***Seeds, The Yearbook of Agriculture, 1961, USDA, Washington 25, D. C. $2.00.***

Since 1933, the yearbooks of the USDA have chosen a specific subject in agriculture, and explored it in detail. This year's book on seeds is the usual bargain in reading material. It contains scores of articles by dozens of experts on all the phases of seeds—their life processes, their production, processing, certification, testing and marketing. It is a worthy successor to its line. (It's a snap at $2.00, but your congressman can send you one free.)

***James Monroe Smith, Georgia Planter, Before and After Death,** by E. Merton Coulter, University of Georgia Press, Athens, $5.00.*

When the Civil War ended, James Monroe Smith was just another destitute young Georgia bachelor. When he died in 1915 he was still a bachelor, but one of the wealthiest farmers and landowners in all the South. The driving theme of his life seemed to be to own "all the land that's next to mine" and he finally wound up with something like 20,000 acres traversed by his own railroad and worked by hundreds of croppers, hired hands and, for some years, convict labor.

His colorful story was summarized in F. Q., Autumn, 1958. Dr. Coulter, emeritus head of the History Department at the University of Georgia, has now put the biography together in detail. It is an amazing tale of farming, trading, politics and litigation, with the unsavory contracting of convict labor adding a weird note.

The "after death" element concerns the legends which grew up around the man and the maze of court proceedings involved in settling his estate. That estate, involving millions of dollars, was completely dissipated within a few years of his interment, by mismanagement and poor investments.

C.R.K.

**SPECIAL OFFER**

**SAVE $1.00**

Starting Sept. 1, at your Wayne Dealer—sturdy galvanized nipple pail (retail value $2.49) for only $1.49 with the purchase of 25 lbs. of Wayne Calfnip . . . or free with the purchase of 100 lbs.

Offer expires December 31, 1961. Good only in U.S. Void where prohibited, taxed or otherwise restricted by law.

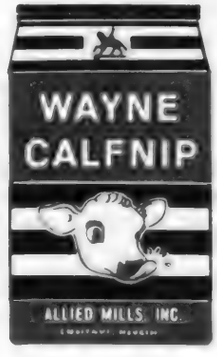
*WAYNE*

# CALFNIP®

## *OUT-PERFORMS MILK . . . COSTS LESS, TOO!*

**AND TO PROVE IT, Wayne Invites You To Be The Judge! Try Calfnip Today And Take Advantage Of The Special Nipple Pail Offer (See Above) At Your Local Wayne Feed Dealer.**

Wayne Calfnip, the superior milk replacer for Calves, Lambs, Pigs, is easy to mix, easy to feed, reduces digestive upsets, and gives a rich, nutritious, uniform ration. And there's real economy . . . 25 lbs. of CALFNIP lets you sell about 200 lbs. of whole milk. Builds better calves, too! But, you be the judge . . . get a supply and try it now! The results will be your proof that CALFNIP is the finest milk replacer available, and delivers everything you demand in economy and efficiency.




**WAYNE CALFNIP IS NOW AVAILABLE IN THE NEW 50 LB. BAG FOR EVEN GREATER ECONOMY—see your nearby Wayne Feed Dealer!**

***ALLIED MILLS, INC.*** *Builders of Tomorrow's Feeds . . . Today!*

Executive Offices: Chicago, Ill. • Mills at: Guntersville, Ala. • Gainesville, Ga. • Peoria, Ill. • East St. Louis, Ill. • Fort Wayne, Ind. Mason City, Iowa • Omaha, Neb. • Buffalo, N.Y. • Everson, Pa. • Memphis, Tenn. • Fort Worth, Texas • Portsmouth, Va.

# Most Farmalls get Sundays off for good behavior

*Greater efficiency earns you more "free time"... greater economy saves extra dollars to enjoy it!*

New Farmall® tractors—from the 1-plow Cub right up to the league-leading 5-plow 560—have a way of stealing the show whenever farm folk get together.

Before the men can be coaxed to the picnic table, they'll check a new Farmall from radiator to hitch to see the latest time and labor-saving features. They'll listen to the host tell "Gramps" the two big advantages of Multi-Range power: (1) How it gives the big Farmall 560 power to spare for toughest jobs. (2) How it lets the 560 "loaf" on light work to match smaller tractor economy.

A wise guest will head for the table before a Farmall owner starts talking about Torque Amplifier. If he doesn't, there'll be only backs and wings left when the proud owner finishes telling how TA seems to flatten steep slopes and erase tough-spots without shift-down delays.

Sure, the hostess frets about "gabby" men and the way their talk complicates her picnics. But, as the family bookkeeper, she knows that the sizable fuel and upkeep savings of Farmall tractors "buy the treats" for family and friends who help to make Sundays relaxing fun-days.

**Wade through tough spots non-stop** with millions-of-hours proved Torque Amplifier. There's no stopping, no clutching, no over-speeding the engine. Just pull the convenient TA lever to boost pull power up to 45% on-the-go! And you don't have to coddle TA. It's super tough . . . ready to work whenever you need it.

**Get the feel of a new Farmall!** No other tractors offer the same perfect balance of power and weight . . . the same combination of proved work-saving, money-making features. Call your IH dealer. He'll make all arrangements for you to field-try a new Farmall.

**INTERNATIONAL HARVESTER**
*World's largest manufacturer of farm equipment*

# FIRESTONE TRANSPORT-100* TIRES

## cost no more, wear 50% longer on farm trucks!

That's right—this totally new tire from Firestone costs no more than conventional farm truck tires, yet it gives you better service and longer life! Eight years of research and more than 109,000,000 test miles on truck fleets and farms everywhere prove it brings you 50% more original tread mileage and much greater drive wheel traction, too. And that means for every two miles you've expected on your present truck tires, you'll get *three* with Transport-100 tires! Here's why:

**3-Rib Broad-Center** tread and the Transport-100 flatter crown cut down uneven wear and increase grip on roads and pavement, wet or dry.

**Stone Guards** are built right into the Transport-100 tread to keep tread free of damaging rocks and pebbles.

**Exclusive Firestone Rubber-X** stands up to punishment longer to give you the extra years of wear.

**Exclusive Shock-Fortified Cord** in the Transport-100 takes the rough knocks in farm hauling of all kinds, helps tire resist cracking and breaking.

Firestone Transport-100 tires will outpull and outlast any conventional truck tire made for all kinds of farm hauling! Can you *afford* to buy anything less? Put on a set this week at your nearest Firestone Dealer or Store. *Just charge it or buy on easy payday terms.*

*Firestone T.M

Always specify **Firestone** tires on new trucks

**FIRST IN FARM TIRE NEEDS**

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# PROFITS UP... EMERGENCY CALLS DOWN

## ...when your veterinarian keeps herd health HIGH

**TAKE DAIRY FARMING.** It's been proved again and again that planned herd-health supervision by your veterinarian is your best animal health insurance and pays huge dividends in higher production. Health problems are brought strictly under control—including mastitis.

One of your veterinarian's most potent weapons against mastitis is Neothion, made by Squibb. Neothion cleans up mastitis fast—controls even hard-to-kill strains of staphylococci and other bacteria now resistant to older antibiotic treatments. And no worries about residues—just withhold milk from treated cows for 72 hours. (You can feed milk from untreated quarters to stock. No waste.) After 72 hours—sell residue-free milk *with peace of mind.*

**MORE PRODUCTIVE BEEF CATTLE.** Whether you own a few beef cattle or thousands, expert health supervision by your veterinarian will help you get more beef and better beef.

Perhaps your veterinarian has already recommended Synovex *natural hormone* weight-gaining implants. Recently, 234 steers in 5 groups were implanted with Synovex-S and fed an average of 119 days. They gained an average of 86 lbs. more per head than unimplanted steers—7/10 lb. extra per head per day. An average saving of 3¢ per lb. was realized on the total gain of 367 lbs.—or $11.01 per head.

Synovex-S for Steers and Synovex-H for Heifers are implanted (not fed)—your pure-bred cattle won't get hormones by mistake. Synovex implants do *not* contain stilbestrol or other synthetics. No hormone residues in meat after slaughter, no loss of carcass grade.

**SQUIBB—HONORED NAME IN VETERINARY MEDICINE.** Many of today's outstanding developments in veterinary medicine had their origins in the Squibb Research Laboratories. As with all SQUIBB drugs and pharmaceuticals, the words A NAME YOU CAN TRUST are your proof of purity, potency and integrity.

E. R. SQUIBB & SONS, *Veterinary Department*
745 Fifth Avenue, New York 22, N. Y.

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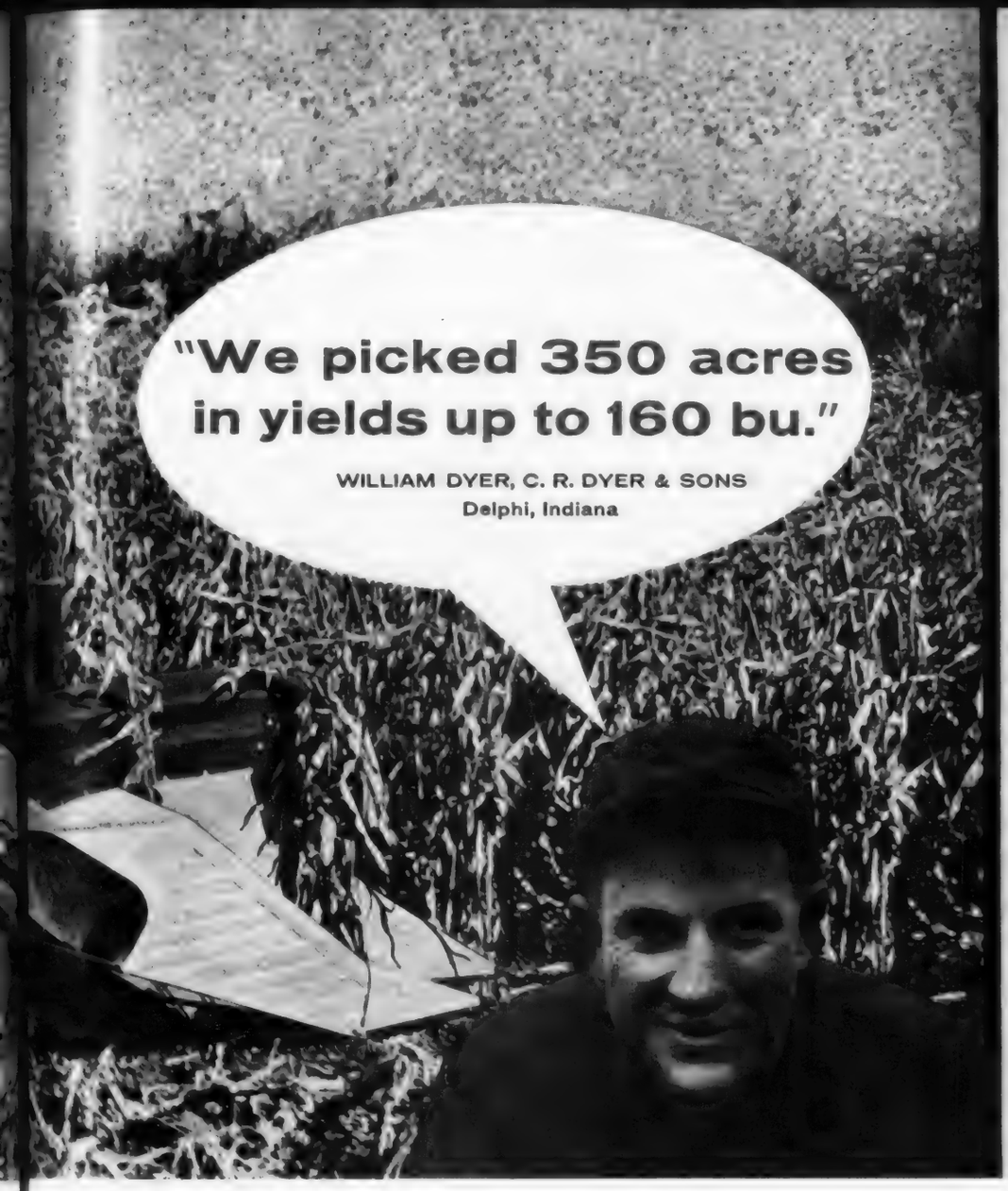
**SQUIBB** A NAME YOU CAN TRUST

# NON-STOP PICKING!
# BIG CAPACITY!
# BRAND NEW!

# NEW IDEA




About a year ago farmers in eight different states bought advance models of these all-new pickers and harvested last year's crop. We wanted to know how these pickers would perform when operated by farmer-owners. These reports typify the tremendous enthusiasm these pickers created:

**"Just took us a short while the first time to mount it on a 620 tractor. And the picker raises higher than any I have ever owned or operated."**
Elmer E. Hinrichs
Miledgeville, Ill.

**"In 310 acres, I didn't have any plugging of the snapping rolls at all. And I picked in wet conditions and extremely dry conditions."**
Lester H. Hoback
Conesville, Iowa

**"There's a lot of room to move around. And the tractor wasn't covered with stalks and trash like the other pickers."**
Albert Naimon
Geneva, Neb.

**"I picked at 2½ to 3 miles per hour. I was well satisfied with the cleanliness. It did just what we expected of it."**
Charles Kinsman
Archbold, Ohio

**"I like the new type snapping rolls. They get the corn off real fast and eliminate shelling and grinding."**
Harold Maurer
Olivet, Michigan

# NEW IDEA'S New Mounted Picker Picks "100-Plus Yields" —Faster...Without Plugging... And You Can Be Sure It Fits Your Tractor Quickly, Easily

The first thing that will impress you about this NEW IDEA picker is its clean, rugged design. A closer look tells you that here is a machine built to pick row after row, acre after acre, without plugging. Here's a picker that ends tinkering and likes to be left alone! Here's a spacious husking bed built to match the capacity of the picker. You just *know* you'll pick and husk more corn — faster than ever.

**UNIQUE UNIVERSAL MOUNTING SUB-FRAME** fits all popular tractors and goes on in just a few minutes. In another 15 minutes the gathering unit and husking bed are attached to the sub-frame, and you're on your way to the fields for truly non-stop picking. In about the same time you can free your tractor for other uses, too. There's less wear on chains and sprockets, as well, because the drive shafts and sprockets are installed and aligned on the sub-frame at the factory.

**EXTRA SAFETY, EXTRA VALUE, EXTRA COMFORT.** All chains and drives are carefully shielded. A ladder, hand grip and non-skid platform over the husking bed are provided for safe mounting and dismounting. You have ample room for your canvas heat housing for those cold fall days. You spend less time lubricating it, too — less than 15 minutes a day — because NEW IDEA makes liberal use of sealed bearings, grease-filled gear boxes and banked lube fittings. See your NEW IDEA dealer today. Choose either mounted or trailing husking bed. *Each has a full year written guarantee.*

FREE LITERATURE — JUST MAIL COUPON

NEW IDEA, Box 183, Coldwater, Ohio

Please rush me the whole story on this great new picker.

NAME_____

ADDRESS_____

TOWN_____ STATE_____

PRODUCT OF Avco CORPORATION

# Shipping Fever

**FQ REPORT**

**PROBLEM:** How can losses due to shipping fever—now calculated at 1% of the cattle feeder's investment—be reduced?

**BACKGROUND:** Shipping fever is a lung disease named for the accompanying high fever. It strikes primarily after shipment at cattle and feeder lambs, and secondarily at swine. Hogmen often call it flu, or pasteurellosis, a name derived from Pasteurella, a causative bacterium. Hemorrhagic septicemia, a scientific name, has fallen from use. Hemorrhages (internal bleeding) and septicemia (blood poisoning) are symptoms of advanced cases and don't point to the primary infection. The disease is similar to croup in children and it is related to the common cold. No particular microbe is the sole agent. The best opinion today names one or more viruses (Myxovirus) as primary cause and a bacterium (Pasteurella) as a secondary invader. Weanling calves are the most likely victims; resistance improves with age. Fall is the peak loss season, reflecting the heavy shipments from the range. Shipping fever is unpredictable. A shipping procedure used year after year without trouble may one year fail to prevent infection. A 1,000-mile trek may be safe, yet a short haul may cause trouble. Shipped animals may stay healthy but carry infection to others.

*Diagnosis.* Diagnosis is tricky. Early symptoms include a fever (105° to 107°F.), reduced appetite, a runny nose and watery eyes. However, a rough trip over dusty roads may produce all these symptoms regardless of infection. Other symptoms, such as a dirty, crusted muzzle, diarrhea or constipation, and a gaunt, droopy look may indicate a number of diseases. Signs of refusal to eat, a soft, metallic cough, and, particularly, fast and heavy breathing most specifically alert cattlemen to shipping fever. Sick dairy cows stop milking and tend to stand with their heads high in the stanchion, mouth open and tongue out. Recently-fresh dairy cattle suffer particularly high death losses. Symptoms appear within 10 days after shipment—approximately 5 to 14 days after first infection. Often death comes within 24 hours after specific symptoms appear. After symptoms clear up, affected cattle are severely set back and make slower gains.

**PREVENTION:** Avoid excesses in restricting space, in exposure to fatigue and stress, and feeding before and after shipment.

*Space.* Overcrowding, even within proper weight limits, causes the harm. An animal falling in a crowded load finds others closing the space above it. Unsuccessful attempts at rising cause shrink, fatigue and bruising, which bring on disease. The Western Weighing and Inspection Bureau recommends the following load limits for cattle in stock cars:

| Size of Car | Weight in lbs. of cattle per head | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
| 36 Ft. | 60 | 50 | 42 | 36 | 33 | 30 | 27 | 26 | 24 | 22 |
| 40 Ft. | 67 | 56 | 46 | 40 | 37 | 33 | 30 | 28 | 26 | 24 |

Exceeding these loads by 10% or more invites serious trouble. A safe load for a 40-ft. double-deck truck is 80 head of 400-lb. cattle, or a total load of 31,000 to 32,000 lbs. A 16-ft. double-deck farm truck has a safe load limit of 150 fifty to sixty-pound pigs. Such a truck could carry 130 fifty-pound lambs.

*Stress.* Plan ahead for operations such as dehorning and castration, and avoid excitement a day or two before shipment. Keep loading movements few and gentle. If possible, don't ship when warm days follow cool nights. In subzero weather, line one side of the transport with tar paper to reduce chilling. The best bedding en route is fine material—sawdust, wood chips, sand or cinders at least 4 in. deep. Straw tends to get tramped down and shifted, leaving the floor bare in spots. If used, straw bedding must be thick, at least 6 to 8 inches. Avoid delays in transit. Trips completed inside the legal limit of 36 hours for uninterrupted travel are safer than trips broken by unloading and reloading at rest stops. Dirty pens at stockyards used for rest stops are prime sources of infection. It pays to insist these pens, as well as livestock carriers, be cleaned and disinfected regularly. When expecting livestock, prepare clean, disinfected shelter and facilities as far ahead as possible. Remove carefully all old manure and feed wastes, two chief harbors for disease germs. After animals arrive, again avoid disturbances. Limit sorting, but do single out and treat animals showing symptoms of infection. Quarantine arrivals in a well-bedded, open shelter for about 3 weeks. Don't overcrowd, and provide plenty of manger and watering space to encourage early eating and drinking.

*Feeding.* Avoid heavy feeding before shipment; especially shun high energy feeds. Withhold feed altogether 12 to 15 hours before loading. After arrival, do not switch cattle from their accustomed rations. Particularly, changes to richer foods should be made gradually. Short pasture or high quality hay are excellent for immediate feeding after arrival. A few hours later, provide water but do not let cattle gulp their fill. Next day, drinking may be free choice.

**MEDICATION:** Antibiotics and sulfa drugs are in common use today, both as cure and preventive. Large volume cattle dealers, who find it hard to avoid having disease germs on the place, use these drugs routinely for prevention.

*Antibiotics.* Penicillin alone is used as a 2-million units dose. A combination of it with dehydrostreptomycin is more common. The dose for cattle and sheep is 1 cc. per 100 lbs. of body weight, but not less than 2 cc., injected into the muscle of the hip or flank. It pays to have a small narrow chute to avoid rough handling during injection. Since cattle tired from the road eat little, fed drugs often miss the mark. Still aureomycin at the rate of 10 to 20 milligrams per pound of feed is sometimes used as additive. Antibiotics and sulfa drugs may be combined to treat serious cases.

*Sulfa drugs.* Sulfamethazine is widely used. A gallon of the liquid form (the cheapest) is used in 125 gals. of drinking water. It can also be fed as a pill with a balling gun or injected into the veins or the rumen. Pills of triple sulfa, 1 grain per pound of body weight for the first day and then ½ grain per pound body weight thereafter is widely used. Hogmen frequently use soluble sodium sulfathiazole instead. Dosage is 1 lb. dissolved in a gallon of water, per 125 gals. of drinking water. Maximum length of medication is 5 days. Longer treatment may harm the kidneys.

*Home remedies.* Hogmen find fumes from kerosene or creosote helpful in avoiding shipping fever. Kerosene is sprinkled lightly over bedding. Creosote is put on the floor, then well covered to avoid burning the skin. Cattle are given 4 oz. of baking soda per hundred lbs. of weight in their water for 2 or 3 days after shipment.

*Tranquilizers.* These drugs seem to have little effect on shipping fever itself. Treated calves do handle more easily 20 to 30 minutes after injection, and spend more time in transit lying down.

*Vaccines.* No long-term immunizing vaccine has yet been produced, though there is hope for such in the future. Short-term protection is possible through anti-hemorrhagic septicemia serum using a preventive dosage of 40 to 50 cc. per animal before shipping, showing, or otherwise exposing livestock to the disease. A bacterin (killed bacteria) popular ten years ago, is now seldom used. When repeat treatment is no drawback, injections at approximately 10-day intervals ending 10 days before shipment are tried.

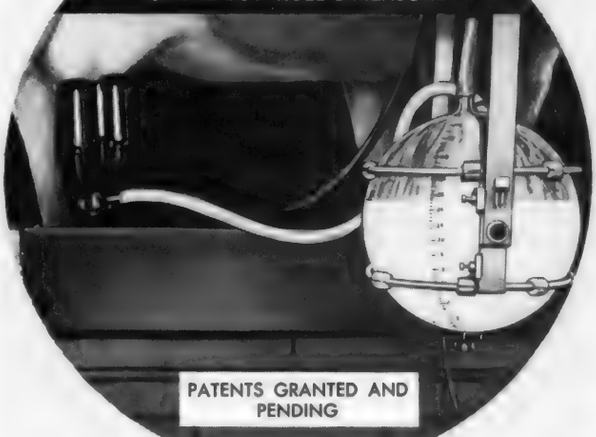
**CURE:** Chances for prompt recovery are best if sick cattle are treated early. After sick calves are first noticed, check well animals at least 2 to 3 time daily for symptoms. Isolate sick animals in dry, draftless quarters at least till their noses and eyes stop running and temperatures are back to normal for a week. Re-examine and treat animals at least once daily. Repeat doses of medicine, such as sulfa drugs, should generally be cut in half. Consult the veterinarian on this. As stated above, symptoms of more serious diseases may be mistaken for shipping fever, and sick animals are sitting ducks for further infection. Professional care will prevent heavy losses. Dead animals should be disposed of promptly. Recovered animals should be put on full feed gradually. Clean and disinfect contaminated housing, feedbunks and watering tanks. Expose to sun and air as long as possible before reuse.

# CHORE-BOY Is FAR AHEAD In—

**SEE**
One Man Milk 50 to 60 Cows Per Hour With a CHORE-BOY HERRINGBONE MILKING SYSTEM

PATENTS GRANTED

**SEE**
How Much Milk Every Cow Produces at Every Milking With a CHORE-BOY ROLL-O-MEASURE



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**SEE**
That Your Entire Milking System Is Clean With a CHORE-BOY ROLL-O-CLEAN RELEASER

THE ONLY SPHERICAL GLASS RELEASER

The Milk Is Always Visible Until It Enters The Bulk Tank —

PATENTS GRANTED AND PENDING

## ❶ Highest Milk Production Per Man
## ❷ Highest Milk Production Per Cow
## ❸ Highest Quality Milk at Lowest Cost

Profit in dairying depends on 3 factors: (1) **Price of milk;** (2) **Production of milk per cow** and (3) **Production of milk per man.** The individual dairyman can't do much, if anything, about price but he can do something about 2 and 3, and Chore-Boy is in the best position to help him.

### HIGHEST MILK PRODUCTION PER MAN

- Cows are handled in groups and angle parked.
- The operator is never more than 3 feet from the cow's udder. This saves time.
- Feeding is done while cows enter. This saves time.
- One man can handle 4 to 6 milker units.
- One man can milk 50 to 60 cows an hour and milk them properly.

### HIGHEST MILK PRODUCTION PER COW

- The Chore-Boy Roll-O-Measure shows how much milk each cow produces at every milking.
- Low producers can be spotted and eliminated — the first step in raising average production per cow.
- Roll-O-Measure reveals bloody milk. Milk from treated or fresh cows can ke kept out of milk line.
- Provides low-level milking and a vacuum reserve close to udder.
- Chore-Boy low-vacuum milking combined with master pulsating is pleasing to the cows. Gentle and fast.
- Low-vacuum milking helps eliminate a major cause of mastitis.

### HIGHEST QUALITY MILK AT LOWEST COST

- The milk line is visible from udder to bulk tank or cans.
- You can see that your system is clean.
- Dirt can't hide behind glass.
- Air injections in wash water create slugs of water that travel at a high velocity giving a vigorous washing action.
- Washing is done entirely by vacuum — does not require an additional pump.
- Washing is done with ⅓ the hot water and detergents.
- Automatic washer does the entire washing operation without further attention from the operator.

### MOST PLEASURE AND PROFIT FROM DAIRYING

The Chore-Boy Herringbone Pipeline milking system enables you to handle, milk and feed more cows in less time, and with less effort. It puts more profit and pleasure in your dairy operation and pays for itself in a short time from increased income. We will be pleased to help you plan the system best for your needs. Contact your nearest Chore-Boy dealer or write us.

CHORE-BOY'S NEW GOLD STAR SERVICE POLICY IS YOUR GUARANTEE OF SATISFACTION

CHORE-BOY LOW-VACUUM MILKING SYSTEMS®

WITH CHORE-BOY'S PURCHASE PLAN YOUR EQUIPMENT PAYS FOR ITSELF AS YOU USE IT

*For Complete Information, Write* CHORE-BOY MANUFACTURING CO., Dept. 18, Cambridge City, Ind.

# BELL SYSTEM ANNOUNCES A PROFITABLE NEW FARM COMMUNICATIONS TOOL THAT SAVES MAN-HOURS AND IMPROVES EFFICIENCY

# FARM interphone

**Interphone gives you phones where you need them**

The Interphone system provides telephones at important work locations in the outbuildings. These phones are tied in to the main station in the house. You can take or make calls from any of them. No need to miss or postpone important calls. The people you do business with are as near as your closest phone. These handy extensions are used exactly as you would use a regular telephone. Incoming calls can ring all locations.

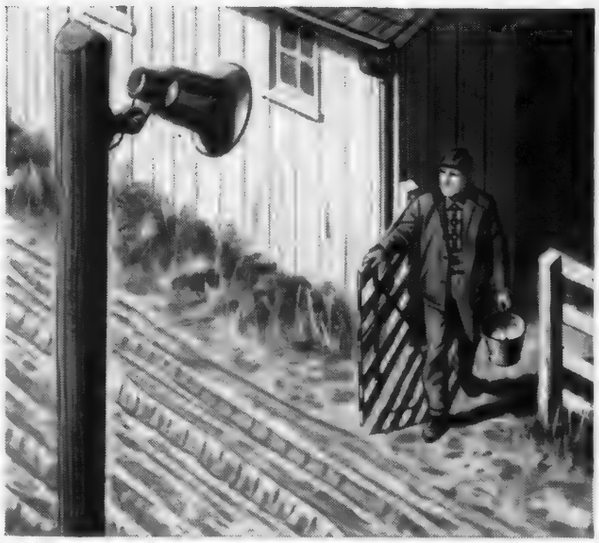
**Interphone gives you and your wife intercom between all phone locations**

Each Interphone station has a compact "speaker-microphone" that is interconnected with all other stations. This enables you to talk back and forth between these locations just as you would in ordinary conversation. If you wish, you can even converse "hands free" by speaking *toward* the speaker-microphone from several feet away.

From the house station your wife can "hold" an outside call while she talks with you on the intercom—then she can relay your instructions, or you can pick up the telephone and speak directly to the caller. This helps make your wife a business partner rather than a messenger. She stays in the house – you and your help stay on the job.

**Interphone gives you**
**outdoor loudspeakers where you need them**

This Interphone feature keeps you in touch when you're outdoors around the farmstead. You can be called over this loudspeaker—and you can answer back "hands free" from considerable distance. The loudspeakers also allow a person in the house to monitor disturbances around the farm.



**Interphone also gives you**
**these extra benefits**

**1** Interphone keeps you in the driver's seat. Use it to instruct hired help or locate a person around the farmstead. Everyone knows what he's supposed to do. So, you get more done in a day.

**2** In an emergency a person on an Interphone farm can make his voice heard all over the farmstead through one or more stations. You can't put a dollar value on this benefit.

**3** A multitude of day-to-day Interphone uses makes farm living more pleasant than ever before. It's used to trade information, keep track of the youngsters, call the family to dinner.

Farm Interphone was designed exclusively for farm use. It can save many times its cost by helping you make the most of your time and opportunities.

Interphone is a boon to farm wives, too. Using Interphone they can now trade information or call their husbands to the phone without running between the house and buildings.

Interphone is designed so that it can be installed to fit the needs of each individual farm. You can have the stations you need—where you need them, in the colors and styles of your choice. Interphone is easy to use. Its operation quickly becomes second nature to farm folks who have it. The cost is low—equipment is maintained in perfect working order at no additional cost.

**BELL TELEPHONE SYSTEM**

**If you'd like to know more about Farm Interphone and what it can do for you, just call your local Bell Telephone Manager—or ask your telephone man if he is in the neighborhood—or mail the coupon below. There's no obligation on your part, of course.**

*Mail this coupon to:*

**American Telephone and Telegraph Company**
**Farm Interphone Division, Room 516A, Dept. G**
**195 Broadway, New York 7, New York**

I would like complete information on Farm Interphone:

Name_____

Home Address_____

City_____ Zone_____ State_____

Telephone Number_____

**Super Hayliner 69**—New Holland's 14 x 18 baler, with automatic wagon-loading feature, Flow-Action feed, Tractor-Seat Controls; without "extras" is Super Hayliner 67. For larger farms, the 16 x 18 Super Hayliner 78 or self-propelled Haycruiser; for smaller farms, the new 12 x 16 Compact Hayliner 65 with Tele-Flow feed.

# Now bale twice as fast with half the labor!

**Today there's a new way to bale—that lets one man bale and load faster than a 2- or 3-man team! Fully proved on hundreds of farms. Choice of five models. New Compact model with automatic wagon-loading feature costs no more than many balers alone!**

Here's the biggest farming news of '61—*proved, practical one-man haying!* No longer need bales be stacked in the wagon by slow, costly human labor. Now one man can bale *and load* automatically—in half the time it takes with manual loading!

### How it works

The new system consists of a New Holland Hayliner—the baler that outsells every other—plus a simple, sure-fire mechanism that "airlifts" the bales into the trailing wagon. You position the bales right from the tractor seat. Doesn't miss—even on turns.

One-man baling and loading has been fully proved on hundreds of farms, with millions of bales. It's ready for you *now*.

### What it costs

Because of its basically simple principle, this New Holland baling method costs surprisingly little. In fact, the new Compact Hayliner 65 costs no more with Bale-Thrower than many balers *without* this feature.

Any Hayliner model you select can soon pay for itself:

- **You will save your own time,** because you will bale steadily at much faster speed.
- **You will save labor costs.** Instead of loading wagons, your helpers can be doing other, more profitable work.

### At your dealer's now

If you already own a twine-tie New Holland Hayliner, you can easily convert to one-man haying. If your present baler is another make, your New Holland dealer will offer you a generous trade-in, and terms that let you pay as you save. See him right away for a demonstration; plan to enjoy the savings of one-man haying *this* year! New Holland Machine Co. Division of Sperry Rand Corp., New Holland, Pa.

**BALER BOY TWINE** gives you imported twine economy plus New Holland's rigid quality control. For extra strength, ask for New Holland's Super 9 or Long 10 twines.

**NEW HOLLAND**

*"First in Grassland Farming"*

# LETTERS

### Syrup for the Flies

Sirs:

Your presentation of the face fly problem and the various methods of control was very clear and concise. There is only one word of advice with regard to the DDVP syrup baits and that is in regard to the type of syrup used. The ordinary corn syrup which can be purchased in the grocery store is best adapted to this method of control. This syrup is a 42% dextrose equivalent syrup. Several of the commercial syrups sold last year were formulated with 68% dextrose equivalent syrups. The 68% syrups absorbed moisture readily and were leached from the animal's forehead. Their effective period for killing the face flies was limited to about 4 to 6 hours.

W. N. Bruce, Entomologist
State of Illinois
State Natural History Survey Division
Urbana

### Radioactive Potato Storage

Sirs:

I would like to know what they are doing in the States with isotopes and radioactivity so far as farming is concerned. I recently put my potatoes in radioactive pumice stone and they are keeping nicely. I have a Geiger counter and know what the count is. Since it is quite high with a mass of pumice stone, I am getting good results. I want to know how to charge the seed corn and wheat with isotopes so that it will get off to a better start.

I have several hundred pigs and so am interested in all pig stories on how to fatten them more quickly. I have no trouble keeping them alive and do not need fancy housing since my temperature is always like eternal spring such as you find in Ohio in April and May or perhaps in October. The weather never changes on the Equator and sitting 10,000 feet high in the Andes mountains.

Howard N. George

Quito, Ecuador,
South America

### Snakes in the Motor

Sirs:

I was interested in your article titled, "The Motor for the Job" where you speak of the problem of keeping dirt, dust, and moisture out of the wiring. We had a case here which I think beats anything you've ever heard of. The motor for our well is set in a concrete pit which is carefully covered. Even so, mice manage to get in and make their nest on top of the warm motor. They also take pleasure in gnawing off the insulation on the wires. But—this wasn't what caused our trouble. A small blacksnake got into the well pit—attracted by the mice. After eating a baby mouse he crawled into the motor-housing to sleep it off and gummed up the whole motor when it started. At first we thought the armature was burned out. When we discovered the real cause, the electrician would hardly believe us.

Grant Johnson

Summerside, Ohio

### Wrong Town

Sirs:

I enjoyed the article on potatoes very much. But who ever heard of the Oregon State Fair at Portland? The Pacific International is held in Portland after the State Fair is over in late October. Portland is our largest city and seaport but the State Fair is held in Salem, the state capital, about the first of September.

Raymond S. Smith

Burnt Woods, Oregon

### Wage Rates

Sirs:

I have read your article on Farm Labor organizing. One item I thought you should check closer. You stated California farmers are paying the highest wage scale in the country. In another place you mentioned the situation at 4 A.M. there, including the contractors, Mexicans, winos and itinerant workers and thereby show you have some knowledge of the situation. You stated one contractor was offering $5 for fruit picking. I believe at harvest time in Iowa a man can make $10 and his board and more than that in Michigan or New Jersey.

I did not know of the 12 men to a room flophouses but have seen the housing on the farms and saw them standing on corners at 5 A.M. waiting for the buses. Kennedy called it a disgraceful situation. It doesn't seem right, considering the value of the crop, that the conditions you describe should exist. You can't describe the California heat on stoop labor. Their $5-7 per day harvest wages may not be the cheapest but certainly not the highest in the country.

Laura Finnegan

New Haven, Indiana

### Concrete—and Nutrition

Sirs:

I was interested in your article on tilt-up concrete construction in your Summer issue. To me, this kind of thinking makes sense in that it uses an imaginative approach to save money and improve the building. A couple of years ago we built a new home and, I assure you, the contractor used his imagination only to increase the cost. When I think how much more sensible we are about farm structures such as tilt-up concrete and pole barns as compared to home construction I get mad. Then I remember that we know and practice infinitely better nutrition for our hogs and chickens than we do for our cornflake-eating selves and I get still madder.

George Wilcox

New Frieland, Neb.

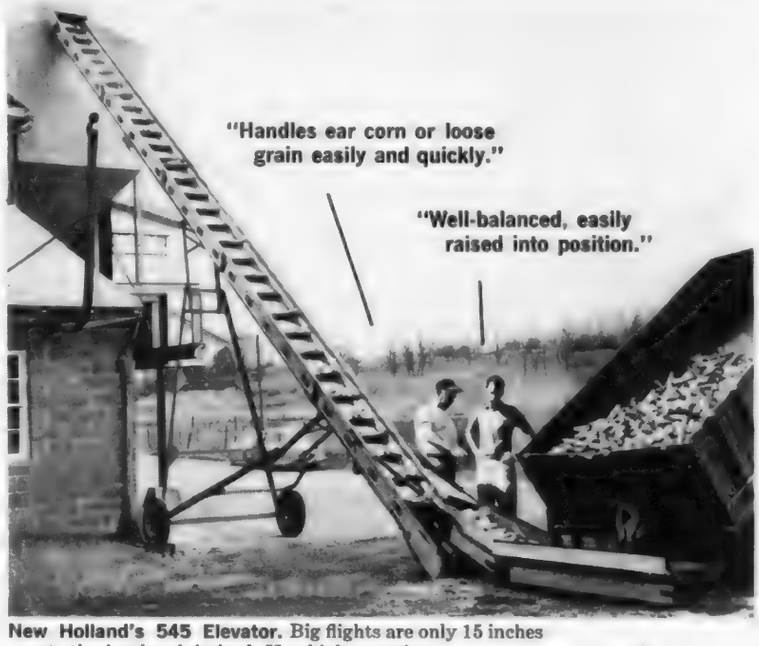

## Can't bounce off, twist off its chassis!

**New Holland's 545 Elevator makes fast work of grain bin fill-ups!**

Safe, fast, easy for one man to move about and use—that's New Holland's rugged 545 Elevator! It's custom-designed to put away a lot of grain *fast!* Handles hay and silage, too! Check these features:

- **Winch and cable** multiply your lifting effort 80 times. Positive-latch winch "locks" at any elevation.
- **Safety lock design** anchors trough solidly to chassis.
- **Easy-lift 9'- or 11'-hopper-feeder** folds right over the elevator for transport or storage.
- **Rugged 20½"-wide trough sections** are 16-gauge galvanized steel. Available in 4', 8' and 10' lengths.
- **Large chassis** fits elevator lengths of 36' to 52'. Standard chassis fits elevator lengths of 26' to 42'.
- **Long life** assured by roller chain speed reduction, fibre slip clutch and sealed, greased-for-life bearings.
- **Snap-on 360-degree head** with various combinations of telescoping or plain spouting. (Optional).

Ask your New Holland dealer to demonstrate this big-capacity elevator on your farm; check his flexible finance plan. See all the advantages of owning New Holland quality!




**New Holland's 545 Elevator.** Big flights are only 15 inches apart; tipping is minimized. Has high capacity, because chain rides high on flights.

**New Holland's 155 Elevator** (*right*), with patented non-tilt flights, handles bales of all sizes at elevations up to 60 degrees.

*Free booklet!* Write New Holland Machine Co. Div. of Sperry Rand Corp., New Holland, Pa.

DIAL & DEAL *For Top Value, Dial Your Dealer Today*

NEW HOLLAND *"First in Grassland Farming"*

# Bedding

## FQ REPORT

**PROBLEM:** Finding inexpensive livestock bedding is increasingly difficult.

**BACKGROUND:** As they become specialized, livestock producers experience straw shortages. Last winter a Michigan cattle feeder bought two to three $75 shipments of straw per week for bedding 400 steers. Alaskan dairymen fly in straw from Washington state. When substituting other bedding, local availability is a chief consideration. The value of a substitute depends on water-absorbing capacity (pounds of water absorbed per hundred pounds of bedding). The table on the next page shows approximate ratings.

Other important requirements of bedding are: (1) Cleanness; this excludes bedding containing dirt or dust which might cause odors or stain livestock. (2) Ease of handling. (3) Ease of cleanup and disposal. (4) Dryness. (5) Non-irritability from dust or components causing allergies. (6) Texture or size that does not get tangled in the wool.

**FARM-GROWN BEDDING:** Straw and stover are time tested.

*Straw.* The only straw more absorbent than oats is flax. Long straw is more absorbent than chopped straw, and threshed straw is more absorbent than combined straw. Disadvantages of straw are high handling and storage costs and a tendency to break down and lose absorbency.

*Corn stover.* Yields of stover per acre are up to 50 percent higher than oat straw. Handling and storage can be solved in some locations by leaving stover in the field till needed. Two or three rounds through a 50-acre field with a flail-type chopper and self-unloading wagon each day can yield enough bedding for 30 to 40 dairy cows, plus replacements, 100 steers and 6 or 7 hoghouses.

**BYPRODUCTS OF FIELD CROPS:** These may be free for the hauling from an elevator or processing plant.

*Corncobs.* Whole cobs are rough and clumsy underfoot so farmers often cover them with a thin layer of straw or ground cobs. Crushing or grinding exposes more of the absorbent pith, or core, besides improving comfort. To help save baby pigs, put crushed or ground cobs under the sow and provide softer bedding—straw, peanut hulls, or shavings, in the creep area for baby pigs. The harder bedding near the sow repels, and the soft bedding attracts, to keep pigs away from the danger of crushing.

*Peanut hulls.* This versatile bedding handles easily, is highly absorbent, and makes good compost. A disadvantage is that it tends to be dusty. It costs about $7 per ton, bagged at the plant.

*Processing Wastes.* Those used for bedding include: dry cornhusks, available at some grain elevators, sugar cane bagasse, oat hulls, cottonseed hulls, and wheat bran.

**WOOD PRODUCTS:** Waste wood makes good bedding except for sheep, as the fine material tends to tangle in the wool. Softwood (on a weight basis) is about twice as absorptive as hardwood. Green wood has only 50% the absorbing capacity of dried wood. Drying in storage helps. Extra wood used to offset low absorption makes a deeper, softer bed and brings returns as manure by improving soil tilth. Topdressed on pastures, wood fragments mat down the grass less than straw. Acidity caused by plowing down wood manure is not as great as commonly believed and its effect is temporary. But try to bring land with a low pH to normal before spreading. Wood decomposing in the soil tends to tie up nitrogen but generally nitrogen in the manure offsets this.

*Wood chips.* Chips in stanchion dairy barns stay in place better than straw or stover. To obtain chips check utility companies, local road crews, orchards, tree nurseries and plantations, which may use chippers to eliminate trimmings.

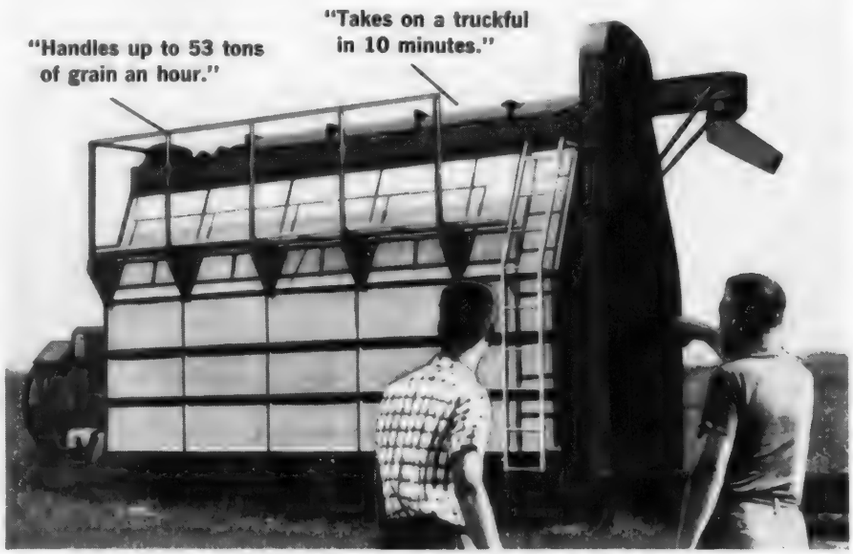
About 10 manufacturers sell chippers. They make it easier to keep woodlots clean and thinned and provide soft, dust-free bedding from branches of one inch and above. Branches can be dried before being chipped for bedding. Purdue University researchers tried Fitchburg (Mass.) Engineering Corp.'s movable machine with a cylindrical, 6-knife cutting head, powered by a


## Prevents grain cracking and deformity!

**New Holland's 765 Dryer circulates grain at selected rates for faster, more even drying!**

New Holland's big Model 765 Grain Dryer dries your choicest grains to perfection. Ideally suited to normal year-in, year-out operation because it's got the built-in reserve you need for even the toughest drying jobs! Check these outstanding features:

- **Exclusive new process** alternately heats and tempers grain; prevents cracking, deformity; circulates grain at the same rate for faster, more even drying.
- **Uniform heat distribution** assures top-quality drying, safe temperatures.
- **Exclusive bucket elevator** and grooved sprocket teeth are specially designed to prevent crushed grain. Lets you handle up to 53 tons per hour.
- **Handy control center** puts all electric and fuel adjustments at your finger tips.
- **High drying capacity** lets you keep up with today's fast harvesting.




**New Holland's 765 Grain Dryer** (585-bushel capacity) **dries your grain to highest market quality. Easy to move where you need it most!**

- **Sectionalized drying bin** lets you dry large or small batches fast and efficiently.

See your New Holland dealer for all the details. Check the 350-bushel "735" Dryer, too. Both are available in electric- or tractor-driven models. Easy to own, too—with your dealer's flexible finance plan.

*FREE BOOKLET:* Write New Holland Machine Company Division of Sperry Rand Corporation, New Holland, Pa.

DIAL & DEAL *For Top Value, Dial Your Dealer Today*

NEW HOLLAND *"First in Grassland Farming"*

50-hp engine, and costing about $960. They rated production at 4 tons per hour. Cost of farm-produced chips is $5 to $6 per ton.

*Sawdust.* Sawdust is the most absorptive wood product; the finer the grind, the more it absorbs. Sawdust is dusty when dry, and forms a cake when wet, particularly in poultry houses. Occasionally pigs eat sawdust and plug their digestive tracts, so it's best to keep it from small pigs. It is not recommended for day-old chicks.

*Treebark.* This bedding is a byproduct of pulp and veneer mills and of leather tanneries. Common Vermont mill prices are 2¢ to 3¢ per bu. Grind bark in a hammermill with a ¾ in. screen. Screenings from a debarking machine are O.K. Some farmers like a bark-sawdust mix. Bark decays fast and makes better fertilizer than other wood products. Dry bark tends to be dusty, like sawdust. Bark does not cause temporary acidity in soil as it contains ample lime. It is apt to be wet, but limited trials show bacterial action can dry *small piles* of bark stored indoors without trouble from spontaneous combustion. It is best to fill storage for wet bark only part at a time and to check for overheating.

*Wood shavings.* Wood shavings spread easily and make suitable bedding. Pressed into bales they store compactly. When wet they tend to pack, plugging mechanical cleaners.

**MINED BEDDING:** The most common users are poultrymen.

*Dried peat moss.* This product of peat bogs is four times as absorbent as the best farm or factory byproducts. In some trials in broiler houses peat moss seemed to promote feather picking. Leftover peat moss used for steel polishing is not suited for poultry. Small pieces of metal in the litter get in the gullet and cause deaths. The price of a 7½ cu. ft. bale retails around $5. Near bogs it is cheaper.

*Vermiculite.* This mica-like mineral mined chiefly in South Carolina and Montana, is expanded at 2,000° F. into light, porous granules. It is fireproof, a nonconductor of electricity, sterile, chemically inert, odorless and tasteless. Vermiculite does not tend to get matted and does not stick in the gizzard. It is priced about $1.40 per 4 cu. ft. bag, which covers 24 sq. ft. at the minimum recommended depth of 2 in.

**REDUCING BEDDING NEEDS:** Lamb feeders have restricted bedding to a light cover just deep enough to prevent stickiness inside pens. Slatted floors are used for poultry, hogs, and steers.

*Cow Mattresses.* Two types of rubber bedding replacers for stanchion barns are available in the U. S., corrugated solid rubber and foam rubber. Rubber mats, priced around $30 each, were developed in Holland more than 12 years ago. The U. S. distributor, Bristol Kow Mats, Inc., Shelton, Connecticut, guarantees the mats for 10 years and estimates useful life at 15 years. They are bolted to the concrete next to the feed trough. Production has now started on foam rubber mats enclosed in a reinforced rubber jacket. Foam rubber mats cost about 3 times the price of hard rubber mats, but their price may drop as mass production is started. Life expectancy is at least 4 years, according to a U. S. manufacturer, Joslyn Mfg. Co., Macedonia, Ohio.

Bedding costs normally exceed the cost of even the more expensive mattress. Labor is restricted to brushing the mattresses with a stiff broom plus cleaning the gutters and covering them with straw, to reduce splashing. Mats exactly the size of the stall and stall trainers on cows aid cleanliness.

**Water Absorption of Bedding Materials**

| Material | Lbs. of water absorbed per cwt. of air-dry bedding |
|---|---|
| Hay (mature, chopped) | 300 |
| Oat straw (threshed) | 280 |
| (combined) | 250 |
| (chopped) | 240 |
| Wheat straw (combined) | 220 |
| (chopped) | 210 |
| Rye straw | 210 |
| Barley straw | 210 |
| Flax straw | 260 |
| Corn stover (shredded) | 250 |
| Corncobs (crushed or ground) | 210 |
| Peanut hulls | 250 |
| Sugar cane bagasse | 220 |
| Oat hulls | 200 |
| Cottonseed hulls | 250 |
| Cocoa shells | 270 |
| Sawdust (top quality pine) | 250 |
| (run of the mill hardwood) | 150 |
| Tree bark (dry, fine) | 250 |
| (from tanneries) | 400 |
| Wood shavings | |
| (top quality pine) | 200 |
| (run of the mill hardwood) | 150 |
| Wood chips (top quality pine) | 300 |
| (run of the mill hardwood) | 150 |
| Leaves (broadleaf) | 200 |
| (pine needles) | 100 |
| Peat moss | 1,000 |
| Vermiculite | 350 |
| Sand | 25 |


## World's top-capacity forage harvester!

Two-row cornhead has 26 anti-friction bearings. Wide 34-inch spread between points assures fast feeding, makes it easy to stay on row.

**New Holland's 818 Forage Harvester outperforms all other tractor-driven harvesters under equal conditions!**

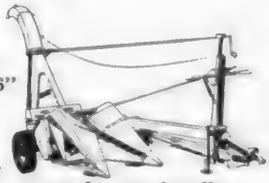
Smooth, steady, even, the mighty "818" has all the capacity you'll ever need! Check these features:

- **Exclusive Micro-Shear Cutterhead** has angled blades that slice in a forward, downward motion. Huge 130-square-inch throat handles tremendous capacity with ease.
- **Built-in knife sharpener** hones knives razor-sharp without removal *in 5 minutes.* Saves power and gives you finer-cut silage!
- **Fingertip tractor seat controls** let you start, stop or reverse the feed table to prevent clogging, back out foreign objects.
- **Discharge spout** switches from side- to rear-unloading from your tractor seat.
- **High-strength roller chain** and sealed-for-life ball and roller bearings throughout.
- **Feed rolls** ride on waves of forage . . . spring-loaded equalizer arms keep material under constant pressure. Working together, they smoothly deliver material straight into the cutterhead.

- **5 dependable attachments** make short, fast work of any forage crop: 1- or 2-row cornheads, 6- or 8-foot direct cut and 6-foot windrow pickup.

Ask your New Holland dealer to demonstrate the "818" on your own farm; check his flexible finance plan. *Free Booklet!* Write New Holland Machine Company Division of Sperry Rand Corporation, New Holland, Pa.

**For smaller farms**—the all-new "616"—a top-performing chopper at compact-car cost. Three new attachments handle all your crops fast and efficiently.



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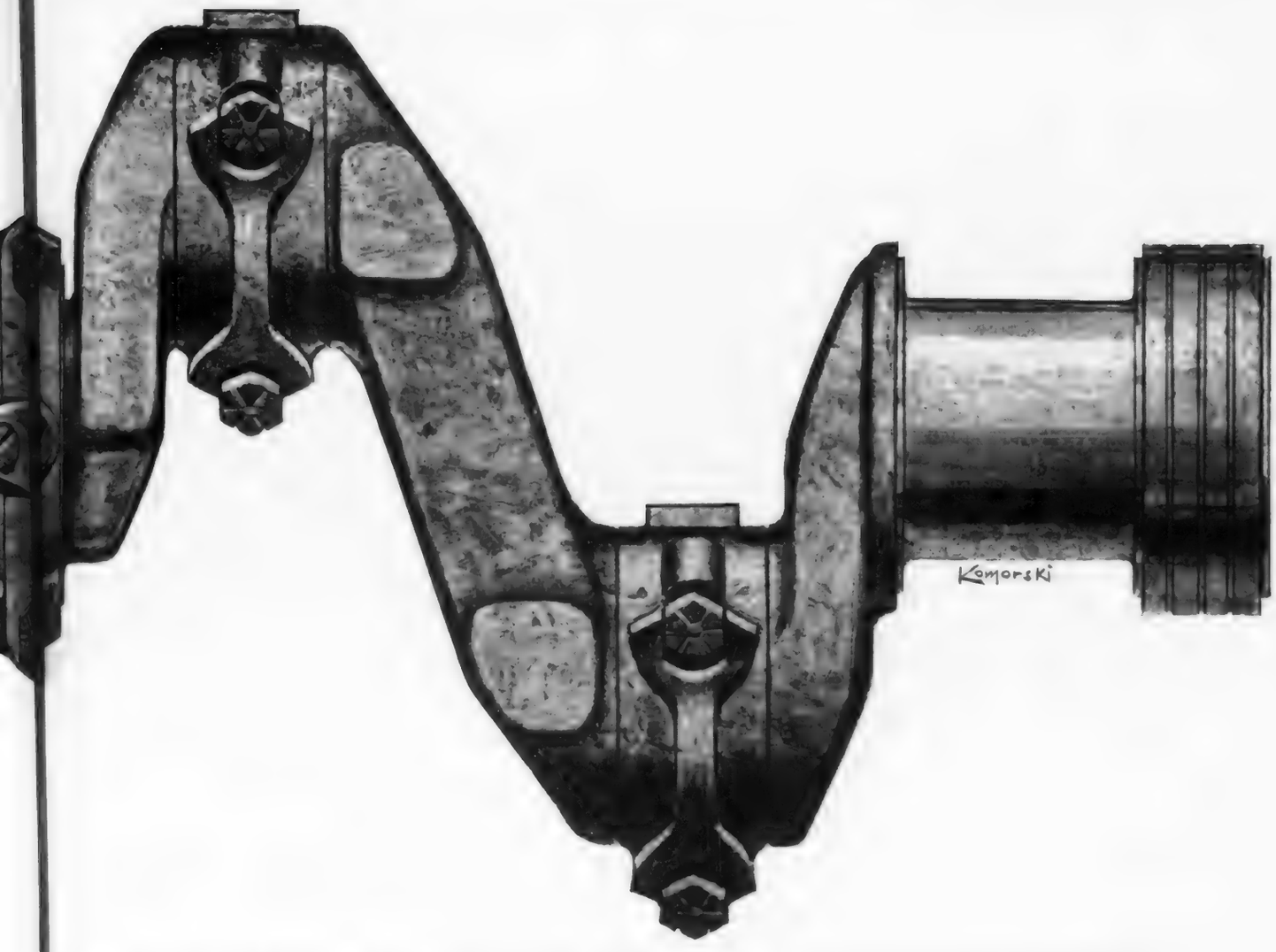
**NEW HOLLAND** *"First in Grassland Farming"*

# Look at the backbone Moline puts in a $2047 tractor!

FARM • MATERIALS HANDLING • CONSTRUCTION AND POWER EQUIPMENT • ENGINES • TRANSMISSIONS • CHAIN SAWS • ELECTRONICS




# If you don't believe you can buy an economy tractor with guts, read about Moline's amazing 48 hp Jet Star

Take a look at that crankshaft . . . extra large, drop forged, heat treated. It's been thoroughly tested: sliced, twisted, even etched with acid. It's typical of the heft and quality Moline builds into the Jet Star. Yet it costs less than any other tractor in its class.

How is that possible? Moline simply uses the same engineering techniques and manufacturing processes employed in producing all its tractors, up to and including the G VI—an 81 hp monster.

For instance, the cylinders are cast in pairs, separate from the crankcase—a Moline difference. Connecting rods are two to three times the size of those in automotive engines. Bearings are immense (as you can see above) yet more precise than the bearings of a fine watch.

All in all, the husky engine is strong, rugged and designed to develop high torque at low rpm for the greatest possible lugging power.

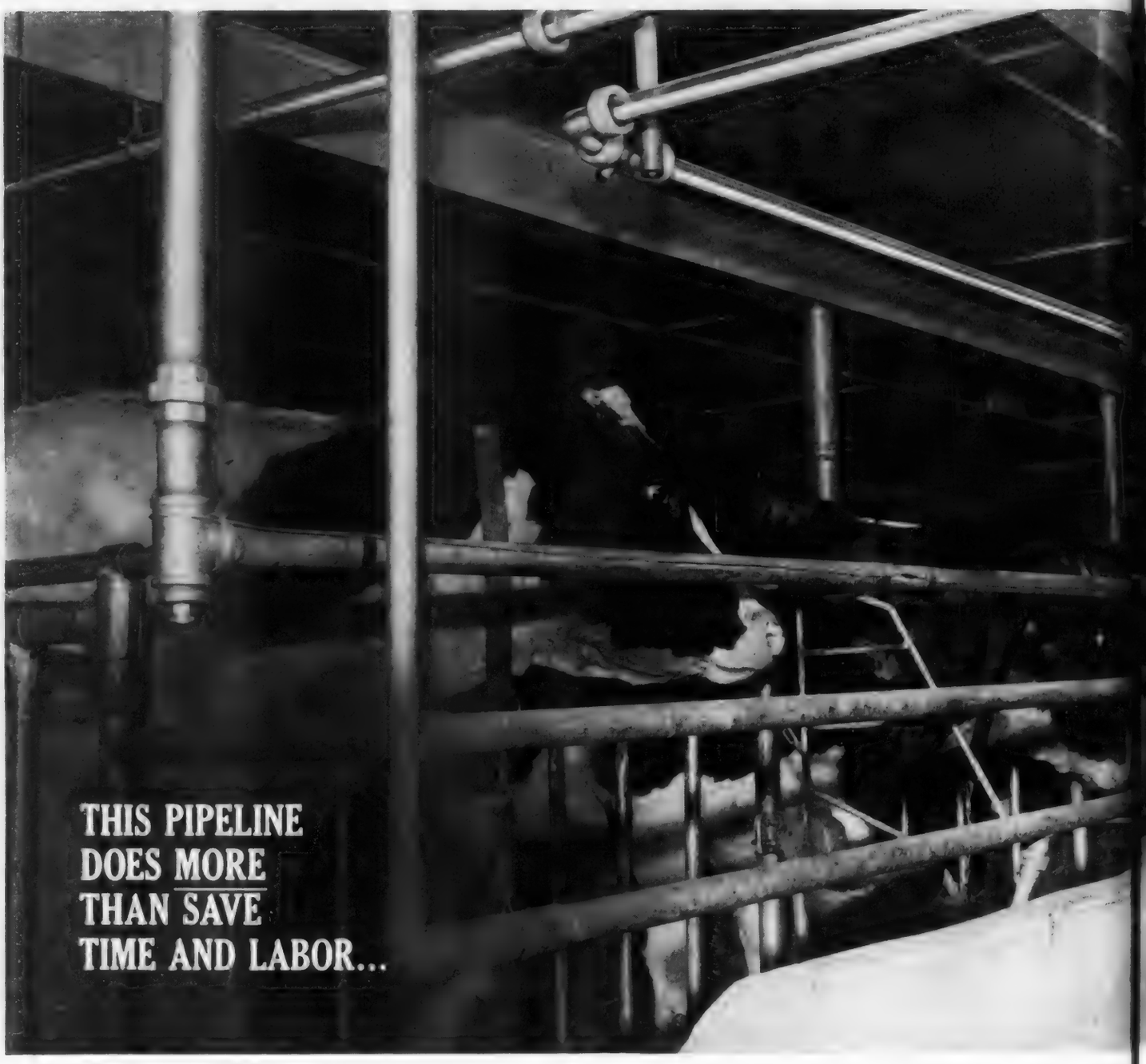
You'll find, too, that just like its big brothers in the Moline line, the Jet Star has a heavy cast crankcase and transmission housing. The engine, transmission and final drive are bolted directly together to form an unshakable solid column of strength that will not twist under heaviest loads.

The Tel-O-Flo hydraulic system and Ampli-Torc drive (optional) are the same as you'll find in the tractors costing twice as much.

If you're looking for a *low* price tractor with *big* tractor quality, the Jet Star is for you. You won't find another tractor in its class with so much horsepower: 56 bhp, 48 on the pto. You won't find another with so much heft, so many features. You won't find another that costs so little. Why not see and test drive the Jet Star at your Moline dealer today.

MINNEAPOLIS MOLINE®

Farm Equipment Division of MOTEC INDUSTRIES, INC. MOTEC




# De Laval Combine Milker keeps udders healthier, m

***A 40-cow stanchion barn installation costs only $1.40 per milking. And you get the extra benefits of fast, clean, gentle milking at no extra cost!***

When you move up to pipeline milking, move up to better milking, too. Get a Combine Milker! It pays to buy the best because it costs no more than the rest.

### Why fast, clean and gentle milking is so important

You need fast, clean milking for top production. When cows let down milk you must get it fast... before udder muscles tire and stop the flow. The milk you *don't* get at this time is lost forever — and when you lose milk twice a day you lose money. Slow milking can also shorten the lactation period and impair udder health.

You need gentle milking to keep cows healthy. Rough milking can make teats hard, sore, lumpy ...can cause congestion in teat canals and lead to udder troubles. But De Laval milking is remarkably gentle on your cows' sensitive teats and udder tissues. This keeps production and herd health up, mastitis down!

### Why De Laval milks better

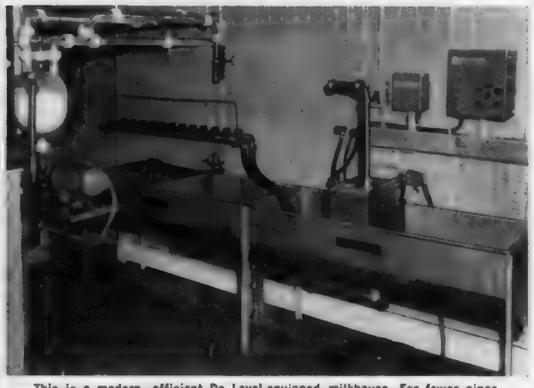
Only De Laval can give you fast, clean, gentle milking because *only* De Laval has this better milking team:

- "Full-Flo" teat cups with narrow-bore liners. Other pipelines use large-bore liners that cause teats to "balloon" to fill extra space. But De Laval narrow-bores fit snug, reduce impact on teats when liners collapse, minimizing danger of udder injury.
- Uniform pulsation. De Laval's magnetic pulsation means *absolutely uniform milking.* There's never a variation no matter who milks.
- Rapid-recovery vacuum. Our *rotary* vacuum pump cuts vacuum drop-offs that cause slow, erratic milking... assures rapid vacuum recovery for fast, uniform milking.

### More sanitary automatic washing

Pressure washers flood lines and slowly push water through at 4 mph. De Laval's "Turbulent Action" *vacuum* washer pulls water through lines at up to 35 mph to *scour* away fat and milk. And only De Laval does not re-circulate used rinse water. Result — more sanitary cleaning, lower bac-

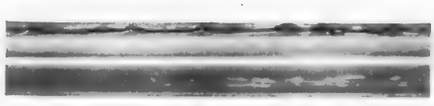
Milking with a Combine Milker is fast, clean, gentle on the cow. Easier, too, because you spend less time stripping and treating for mastitis.



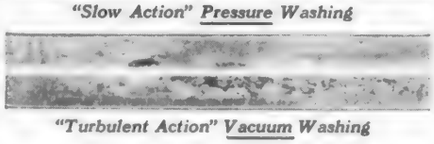
This is a modern, efficient De Laval-equipped milkhouse. Far fewer pipes, wires — everything's electronically operated by a control panel.

De Laval milking is gentle. Put your thumb in teat cup of a De Laval and any other milker for 2 minutes. Feel the difference — see the difference! Thumb at left is red and sore. Other thumb, from a De Laval, has little redness, is not sore.

# ier more productive—and it doesn't cost one cent more!



*"Slow Action" Pressure Washing*



*"Turbulent Action" Vacuum Washing*

teria counts, higher quality milk *with 60% less water and detergent, less electricity*. And it's so automatic you just push a button and walk away.

### The price is right

A 40-cow around-the-barn installation costs only $1.40 per milking after 10% down. You can spread payments over 48 months. Price includes installation and all equipment for milking and automatic washing. For the *exact* cost on your farm, contact your De Laval Dealer.

### Choice of all systems

De Laval offers all systems—side-opening, herringbone, walk-thru and U-shape parlors or around-the-barn installations. Your De Laval Dealer has everything you need, including De Laval stalls that are built better to give you up to twice the life of other stalls.

### Free pipeline milking guide

"Your Pipeline Milking System"—an informative, up-to-the-minute 24-page book gives you the complete story on all milking systems. Loaded with illustrations and practical information. It's free! Get it at your De Laval Dealer, or write: The De Laval Separator Co., Poughkeepsie, N. Y., or 5724 N. Pulaski, Chicago 46, Ill., or 201 E. Millbrae Ave., Millbrae, Cal.

...10% down, up to 4 years to pay.

DE LAVAL

# DE LAVAL COMBINE MILKER*

*Combine Milker is a registered trademark of The De Laval Separator Co.

## *Kewanee* Disks

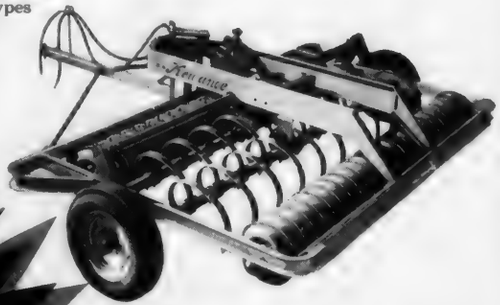
✳The disks farmers prefer! The finest, easiest pulling, longest lasting and highest-trade-in-value disks ever made. Timken bearing equipped! A disk for every farm. Thirteen models to choose from in widths of cut from 7'3" to 20'7" and with your choice of blade sizes and types and various blade spacings. Choose the one best for *you*. A Kewanee will save *you* money.

## *Kewanee* Wagon Gear

✳A really heavy-duty wagon gear that will serve you for years under the heaviest loads you will pull. Superbly built! All-welded construction. Heavy box-axles, adjustable reach, tapered steel tongue and automotive-type steering for easy and safe control. Your choice of rigid, rocking or spring bolsters. Barge box and flare box bolster hoist kits available.

*Kewanee*

# CUSTOMIZED Farm Machinery



## *Kewanee* Mulchers

✳When you can't rake a decent seedbed with anything else, *you can make a high-germination seedbed with a Kewanee mulcher.* An 8', 10' or 12' Kewanee mulcher will make the finest seedbed you ever saw—and absolutely no compaction!

## *Kewanee* All-Purpose Elevators

**The New Kewanee HYDRAULIC—An Elevator Like No Other Before It! The Finest Elevator Ever Offered.**

Here is truly a finely engineered machine for the farmer who wants the best. This new hydraulic truck is streamlined, strong and steady. Smooth, fast raising and lowering. Perfect control! Works with all tractor's hydraulic systems. Three different truck sizes to choose from. A size for every Kewanee Series 500 and 600 trough from 20' to 64'.

**Standard Trucks With Power Raise and Lower Fit All 500's and 600's to 62'**

For the man who wants a medium priced elevator, a 500 or 600 on any one of the five different sizes of standard trucks is a most economical and logical buy. These are long lasting, fast, easy to use elevators of top quality construction and with many convenience features. Raise with PTO, gas or electricity. Choose the one which fits your farm.

**Low-Cost Truck and 500 Trough Up To 42' With the New, All-New Flip-Up Featherlight Hopper**

Here is a truly reliable yet low-cost elevator for low cribs, bins and mows. It has been designed with all the care and precision which has made Kewanees the most preferred elevators and the standard of the industry. The new Flip-Up Featherlight hopper (also available on *any* Kewanee elevator), is an engineering achievement! Only 7 pounds lifts it!

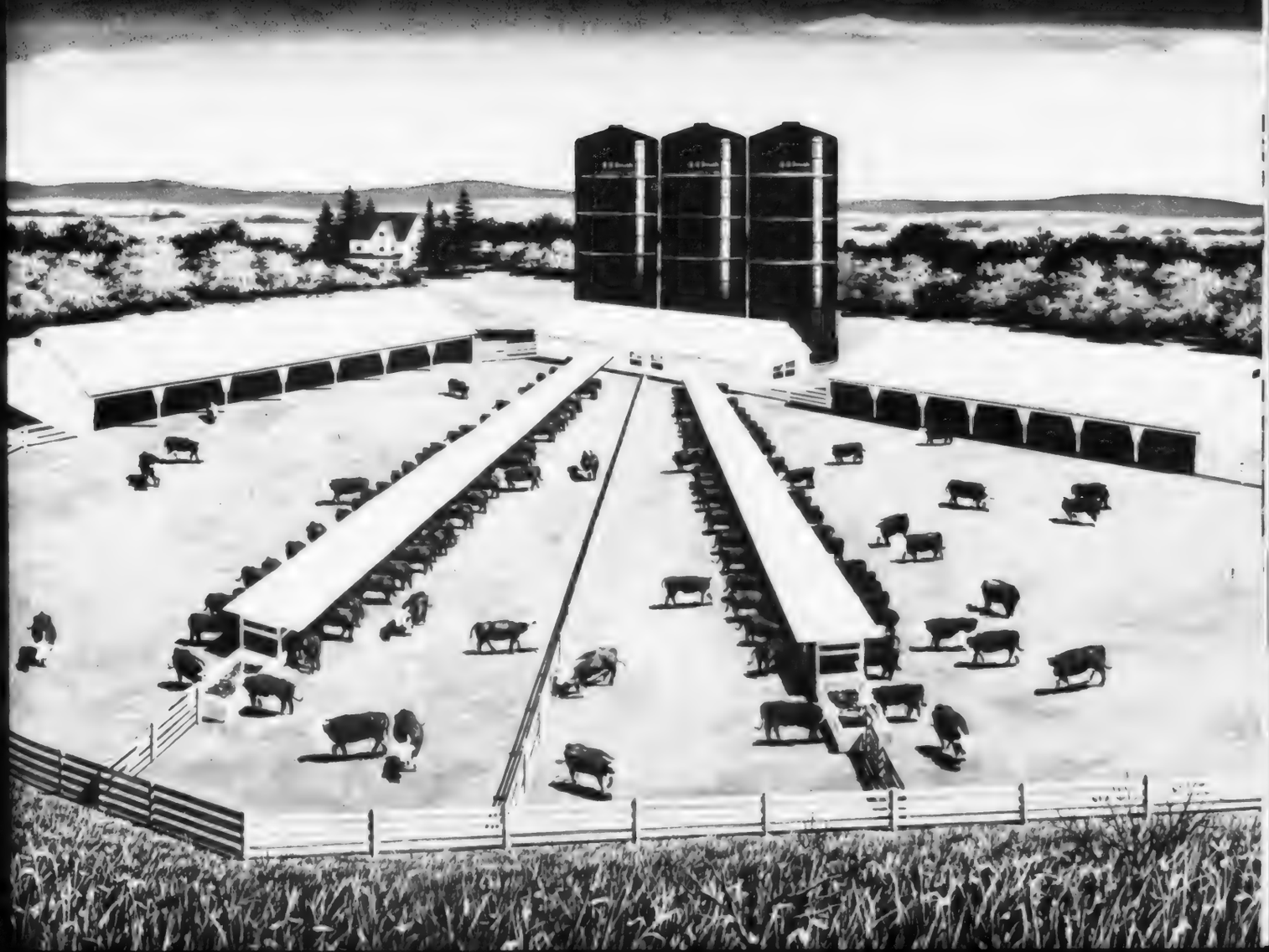
*Developed, Tested and Approved by Farmers for Farmers.*

*Kewanee* MACHINERY & CONVEYOR CO. • KEWANEE, ILLINOIS

# Erase the cost price squeeze from your farm with

# Push Button® Profits

*★SEE HOW AUTOMATION CAN PRODUCE MORE MEAT OR MILK ON THE SAME ACRES WITH LESS LABOR AND LOWER PRODUCTION COSTS*



# HARVESTORE®
# FEED PROCESSING SYSTEM

## delivers all the feed power that's in your land

The cost-price squeeze on livestock and dairy farmers and ranchers continues. The obvious solution: increase profits by producing more meat or milk. But, with conventional methods, even moderate production increases are difficult to achieve—without adding more acres or applying more time and labor.

For this reason, thousands of livestock operators have turned to the one, proven method of increasing livestock numbers on the same acres with less labor and lower production costs. And that's the HARVESTORE feed processing system with its exclusive combination of "oxygen-free" sealed storage and automatic bottom unloading.

"Oxygen-free" storage lets you employ modern crop growing methods to make most *profitable* use of your land and crops. Automatic bottom unloading brings *push button* mechanization to feed handling operations, letting you make most efficient use of your time. That's why *Push Button Profits* describes the advantages you can achieve with a HARVESTORE.

USDA experiments show that many farmers using conventional methods lose up to 40% of the feed potential of their acres through harvesting, field and storage losses. With a HARVESTORE, most of these losses can be eliminated or greatly reduced. So, Push Button Profits begin in the field by delivering the maximum feed power that's in your land. First, you can . . .

### Harvest any forage or grain crop at peak nutritional value

Using conventional feed storage methods, hay and grain crops for on-the-farm feeding have to be stored at extremely low moisture levels to prevent nutrient loss and feed deterioration. Green-cut forages are saturated with moisture during ensiling and packed tightly in an effort to reduce oxygen.

All this is unnecessary with a HARVESTORE feed processing system. You can harvest any forage or grain crop at its peak nutritional value—not when the weather dictates. And you can free yourself for other work by eliminating time-consuming, crop-destroying field operations. In other words, you can . . .

### Provide higher nutritive feed and cut storage and field losses, time and labor requirements

Both high moisture shelled and ground ear corn have consistently shown better feeding efficiencies in research work done at Purdue and Iowa State and other college research projects when stored in a HARVESTORE. This higher feed value means more dollars in reduced feed costs. In similar work at another mid-western college, high moisture corn stored in a concrete stave silo showed no feeding advantage, and it was difficult to stay ahead of spoilage. Only in a HARVESTORE have the advantages of high moisture corn been demonstrated by college experiment station research.

But the HARVESTORE is not limited to just one crop. You may wish to use the feeding advantages of high moisture corn this Fall and then fill with Haylage next Spring. The same proven advantages can be demonstrated with HARVESTORE Haylage. Your hay crop can be wilted to 35%-50% moisture, leaving excessive water in the field. Raking and baling can be eliminated, and high protein rich leaves can be captured and processed in the "oxygen-free" atmosphere of a HARVESTORE. Neither is there expensive hay drying. HARVESTORE'S multiple applications make it the most utilized equipment on the farm.

### Preserve feed value—fill-in, feed out any time

A HARVESTORE processes Haylage—instead of merely storing it—to preserve the feed value, which can be lost through unseen spoilage in conventional concrete silos. You can fill-in without damage to already ensiled feed, feed-out with the push of a button—whenever you wish. With Haylage, Push Button Profits pay off in a highly flexible feeding operation, more and more powerful feed, faster gains with lower feed costs.

Similar pay-offs are yours with high-moisture corn, oats, or any forage or grain crop. Why suffer the cost-price squeeze when you can erase it from your farm with a HARVESTORE? Don't let financing hold you up. If local financing is unavailable, your HARVESTORE dealer will be happy to present the A. O. Smith HARVESTORE Purchase Plan. For full information, return the postage-paid card.

**Pick corn early at 20-30% moisture.** A HARVESTORE lets you pick corn weeks earlier when it's at peak nutritional value. Results: higher feed value, very little shelling in the field, fewer lost ears at the snapping rolls, less hard-to-pick down corn. You beat the weather—no worries about early frost or soft corn, no risk or misery of picking in snow or mud.

**Haul directly from field to HARVESTORE.** By shelling or grinding as you pick, you save hours of labor and eliminate losses of loading, unloading, drying, elevating, and grinding or shelling dry-cribbed corn. Corn off early gives you plenty of time to sow small grains for a cover crop and early spring feed or green manure plow down. Bottom unloader handles shelled or ground ear corn.

## *Don't be misled— there's no substitute for HARVESTORE "live storage"*



**Cuts spoilage by excluding air**—Unlike conventional storage units, a HARVESTORE contains an exclusive breather bag system which compensates for necessary changes in air pressure by "breathing" air in and out without allowing it to touch feed and cause spoilage and loss of nutrients. This—combined with automatic bottom unloading—provides true "live storage."

**Deliver 98% of your corn to storage.** According to Purdue and Nebraska studies, corn harvesting losses average 10% with conventional, late-season picking. Storage losses slice off another 8%. A HARVESTORE lets you reduce harvesting losses to a low 2% and completely eliminate storage losses. You feed 16% more corn from the same acres.

## WRITE FOR FREE INFORMATION ON INCREASING FARM PROFITS

**A. O. Smith Harvestore Products, Inc.** H-176
**Dept. FQ-81, Kankakee, Illinois**

*Please send me the following materials without charge:*

- ☐ Harvestore Feedlot Plans Book
- ☐ Harvestore Farm Profit Plan Book
- ☐ Harvestore High Moisture Corn Booklet
- ☐ Harvestore Haylage Booklet
- ☐ College and "On-the-Farm" Test Results
- ☐ Net Worth Study

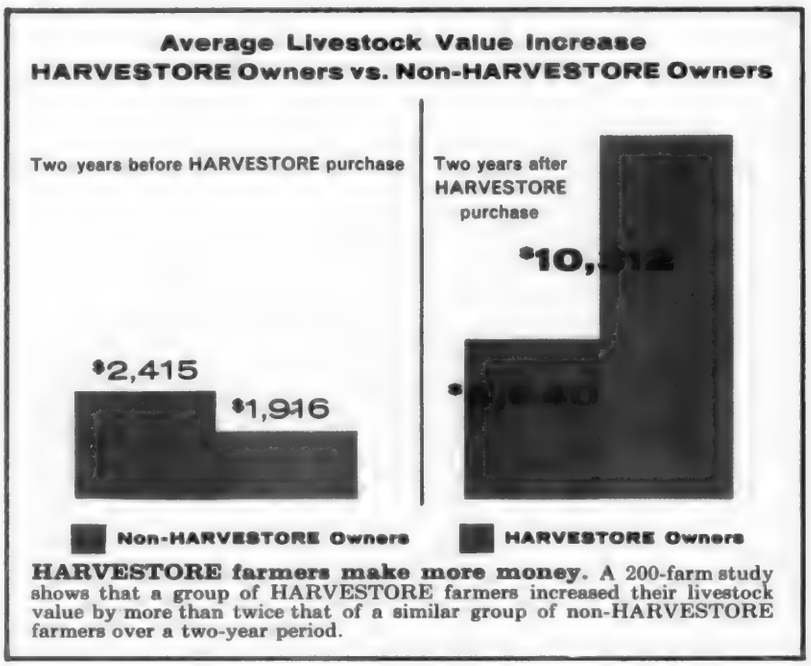
*NAME*_____

*TOWN*_____ *RFD*_____

*COUNTY*_____ *STATE*_____

☐ *I am a student*

# Five-year study shows HARVESTORE farmers increase livestock numbers on the same acres




**HARVESTORE farmers make more money.** A 200-farm study shows that a group of HARVESTORE farmers increased their livestock value by more than twice that of a similar group of non-HARVESTORE farmers over a two-year period.

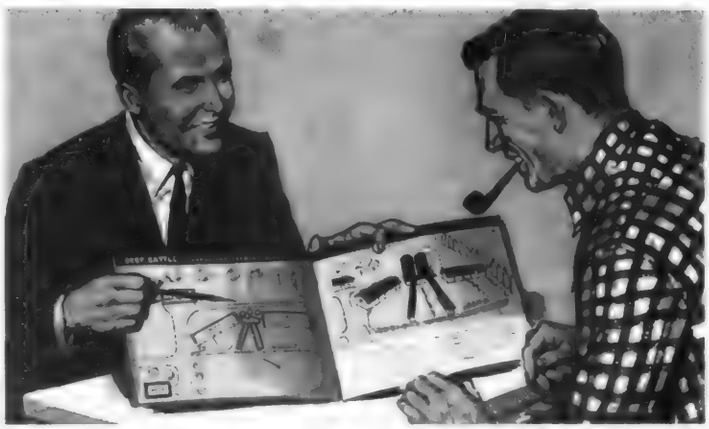
Do HARVESTORE owners make more money? Is a HARVESTORE a wise investment? The answer to both of these questions is a decided "yes." And the proof is contained in a farm net worth study conducted in conjunction with banks and Production Credit Associations.

The study compared financial records of 200 farm operations over a four-year period. During the first two years, none of the farms employed HARVESTORE feed processing systems. Then one group installed them. Here's what happened during the second two years:

(1) HARVESTORE farmers increased their livestock value by over twice that of non-HARVESTORE farmers. Average livestock value increase for HARVESTORE farmers was $10,312—for non-HARVESTORE farmers, $4,640. The HARVESTORE farmers accomplished this increase on the same number of acres. And there was only a two-acre difference in the average size of the farms operated by both groups.

(2) HARVESTORE farmers increased their net worth by nearly twice that of non-HARVESTORE farmers. Average net worth increase for HARVESTORE farmers was $15,138—for non-HARVESTORE farmers with conventional storage, $7,705. This increase for HARVESTORE farmers was substantially greater than the average annual payment on a five-year loan for a 20 x 50′ HARVESTORE.

# What's the best feedlot plan for you? Your HARVESTORE dealer has the answer



**Expert feed lot plans service** is available from your HARVESTORE dealer. He'll discuss the 12 plans in the HARVESTORE Feedlot Plans Booklet shown above, help you design the best plan for your operation.

A well-planned feedlot will apply the best thinking contained in successful feedlots to an operator's individual needs and resources. That's why you'll find a valuable asset in your HARVESTORE dealer's feedlot plans service.

He's a feedlot planning expert. He'll show you successful feedlots in your area. He'll discuss the 12 plans in the HARVESTORE Feedlot Plans Booklet. He'll help you select the features of these plans that will work best for you.

As a result, you'll develop the plan that provides maximum efficiency and working convenience for you . . . greatest comfort for your stock . . . most economical use of your present buildings.

Your HARVESTORE dealer will also supply results of college and "on-the-farm" feeding tests. They show you how you can produce cheaper gains by feeding either forage or grain crops from a HARVESTORE. By returning the self-addressed, postage free card, we will be glad to send you the results of these many college tests on the HARVESTORE processing system. We will also be pleased to see to it that you receive a copy of the Net Worth Study. Your HARVESTORE dealer will contact you about a copy of the Feedlot Plans Book.

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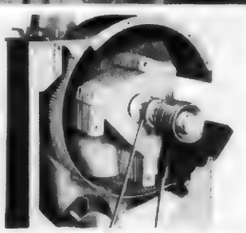
## PAYS FOR ITSELF

Thousands of feeders have already proved to themselves that the Mix-All pays for itself. And every day, more and more cost-conscious, profit-minded farmers are buying the Mix-All to lower their feed costs, without sacrificing either economical rate of gain or feed quality. The Gehl Mix-All can be a cost-cutter for you, too.

With a Gehl Mix-All, you'll reduce feed costs. By using your own grain, you can be sure of its quality. You can easily mix supplements, antibiotics or additives with your grain. Put 'em all in the Mix-All and let 'er go. You get a top, commercial quality feed every time... and at far less than it costs you to haul your grain to town, wait while it's ground and mixed, then haul it back again.

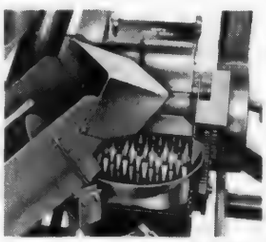
For complete feed-service convenience, you just can't beat the Gehl Mix-All. It grinds, mixes and delivers the feed. There's no need to wait for feed grinding and mixing service. You mix the exact amount of feed you need, whenever you need it, then haul it where you need it and unload with PTO power.

See the Gehl Mix-All in action. Ask your dealer for a Mix-All demonstration right on your own farm. Then buy a Gehl Mix-All and join the other thousands of feeders who've found a Gehl Mix-All the perfect way to lower feed costs and increase profits on every type of livestock feeding.

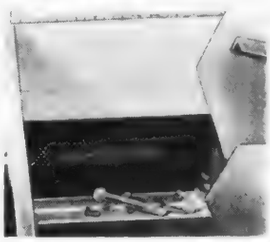


15-INCH MILL with big grinding chamber and long screen gives big capacity and more uniform grinding than any other mill. Thin, sharp alloy steel hammers grind feed downward against a heavy steel grinding plate. 10-inch model also available.

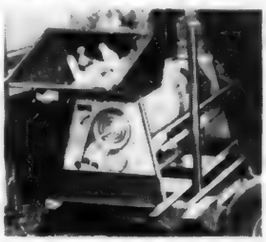
LOW-MOUNTED CONCENTRATE HOPPER for easy addition of concentrates or feed additives. Simply pour additives directly from bag to hopper. Thorough mixing with the feed is obtained automatically. Bag guide prevents bag from being caught in auger.



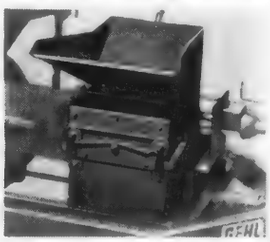
CRUSHER FEEDER SPEEDS GRINDING Grinding ear corn is a snap with the auger and optional crusher feeder. Four-speed auger lets you select a speed to keep the mill full, handles ear corn as easily as shelled corn or oats.



MAGNET KEEPS HARDWARE OUT of the feed. Mix-All's optional magnet keeps all metal materials out of the feed. From smallest bits of sheet metal to the heaviest bolts, damaging hardware is trapped before it reaches the hammermill.



OPTIONAL HUSKER-SHELLER nearly doubles feed-mixing possibilities. Attach sheller shaft to mill drive... shovel ear corn into the hopper. You get instant shelled corn delivered to the mill for grinding or the concentrate hopper for direct mixing.




ROLLER MILL AVAILABLE with the Gehl Mix-All. Here's the perfect combination of feeding equipment if you like to roll grain instead of grinding it. Sturdily built roller mill replaces the hammermill ... you get all the Mix-All features plus roller mill advantages.

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# The Dairy Barn

**Prepared for Change** Ray and Harold Seiter of Brookville, Indiana, can triple the size of their 40-cow dairy herd any day of the week and be ready to feed and house the extra cows within four hours. They could also switch to all beef or confined hog feeding if the future looked bright for these specialties. Meanwhile they handle about 100 head of beef and 1,000 feeder pigs in addition to the dairy.

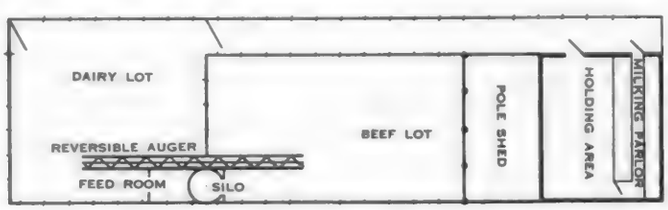
The mainstays of their flexibility are a 185x75-foot concreted feedlot and a 90-foot auger running in the feed manger. The feedlot is divided into a beef and a dairy lot, laid out side by side. The Seiters located the 20x50-foot silo at the center of the manger between the two lots, and installed a reversible distributing auger. This way they can feed only silage to their dairy cows, then reverse the auger and feed both corn and silage to their yearling steers. An added benefit of this feed handling system is that the 3-hp reversible motor powering the auger can do the work of a 5-hp motor that has to push all the silage in the same direction. Most important from the flexibility point of view, the Seiters can knock out the board fence between the sections if they feel like specializing in either enterprise, or turn it into a hoglot.

Ray Seiter is the engineer in the partnership and his brother the husbandman. Both skills were applied in planning the layout. The feedlot adjoins the barn. Inside the barn and next to the lot is the holding area for the dairy; the six-stanchion milking parlor is laid out beside it. The loafing area for the steers is a lean-to pole shed against the barn, and the part of the feedlot used by the steers opens into the pole shed.

This leaves the dairy section of the feedlot on the side farthest from the barn. Before milking, the dairy herd is held in its holding area. After milking, the Seiters can turn the cows out a gate to an alley around the beef housing which leads to the dairy lot.

The manger on the Seiters' lot is four feet wide. The auger inside it has an 8-inch diameter and the 10-inch boards that frame it are 10 inches apart. The amount of silage fed can be varied by raising or lowering the auger. At present the Seiters are feeding two tons, twice a day. They could easily feed twice that much without extending the auger.

The auger is supplied by a silo unloader. The Seiters add concentrate to the silage ration for the steers by pouring bagged grain into the chute from the silo, but they plan to install an automatic metering system.




**A reversible auger and a few rods of fence give flexibility to this lot. It holds 40 milk cows and 100 beef animals and could be shifted to all dairy, all beef, or to a hoglot by changing the inner fence arrangement.**

When asked about cost, Harold said, "We did almost all the work ourselves. I imagine that, not counting labor, we spent about $15,000 on the feedlot, including the pole shed, the silo, and the whole concrete job."

His brother Ray mentioned two limitations. "The silo and feed room block off part of the manger space," he said. "The way things are set up, we didn't see any way to get around that. Another thing is that our silo, which holds about 400 tons of oats, is barely large enough to last our 10-month silage feeding season. Once we expand and really get short on feed, we'll have to build another silo. It will go behind the one we now have, and we'll auger silage from it so we won't have to take away any more manger space. If that runs short, we can easily add to either side and add a section or two of auger."

**Taste Appeal** On all milk retailed in Vermont, a state tax is paid. A very careful record of sales is kept to compute this tax. This record shows sales increased from 1,405,103,100 pounds in 1954, to 1,544,790,400 pounds in 1958. This 139½-million-pound increase took place at the same time as the development of the Vermont Milk Flavor Program—a concentrated statewide drive to improve the taste of the milk produced in the state. In those four years there was no increase in the population of the state, so, in the words of Harold O. Clark, State Milk Flavor Specialist, "It seems reasonable to assume the improvement in taste must be partly responsible for extra sales."

Figures show that out-of-state sales have also increased by over 10 percent since the start of the program. But of course, it is harder to say what part of this increase was due to flavor improvement. Vermont farmers, nonetheless, believe flavor care is worthwhile.

Alec Bradfield, professor of dairy husbandry at the University of Vermont, started the drive to improve the taste appeal of the state's milk with a report that 70 percent of the milk produced picked up off-flavors *between the cow and the consumer.* He labeled these as barny, feed, rancid, malty, and oxidized off-flavors. Not all of these were strong enough to be objectionable, but still it was felt that they dulled the appetite for Vermont milk. The Vermont Extension Service ran tests to see whether the people that handled the milk and drank it agreed. Farmers, dairy plant personnel, retailers, and housewives filled in flavor-rating forms. Farmers sometimes were amazed that they downgraded samples of their own milk, compared with those of their neighbors. The upshot of this was a continuous flavor-testing program at the dairy plants, an effort by taste-conscious fieldmen to help track down the cause of any off-tastes found, and cooperation from producers to eliminate any defects in their milk handling which helped cause objectionable flavors. For example, barny flavors might be due to poor ventilation, dirty stables, or poor milking practices.

Not all off-flavors were picked up at the farm. Fieldmen and technicians found, for example, that oxidized flavors were caused by copper or iron equipment. Today the switch to stainless steel in Vermont is practically complete.

William Knox, technician for a dairy plant near Quincy, believes the last two years have brought further improvement from the program. "I can remember," he said, "when an average of 16 of our 72 producers got a fair to poor rating. Now about eight may get fair ratings. Poor ratings are infrequent."

The success of the Vermont program has spread to other states. Massachusetts now has a similar program.

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A "pinch" of Terramycin *in the feed* every day can help dairymen make more profit. Recent tests indicate over $250 more net profit per 300 day lactation period from a herd that milks an average of 20 cows per day.

In 17 trials with over 2,300 cows, cattle receiving Terramycin produced an average of .87 lb. more milk per day—an average of over 161 lbs. of extra milk per cow during a 186 day period.

To get this type of extra production all you need is enough Terramycin in the feed to supply 75 mg. per head per day. When fed according to directions at this rate, tests show there will be no antibiotic residues in the milk.

## Greater disease control, too

Terramycin *in one or more of its product forms* helps prevent or treat these dairy cattle* diseases:

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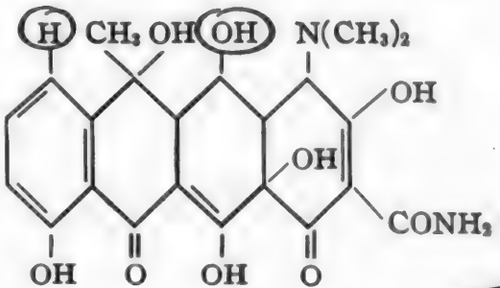
- bloat
- liver abscesses
- scours
- metritis
- leptospirosis
- calf diphtheria
- anaplasmosis
- mastitis
- wound infections
- nephritis
- mixed bacterial infections

**See package directions for use in lactating dairy animals.*

When these diseases hit or threaten, call your veterinarian. He knows best.

## The potency-protected molecule makes the difference




There is a difference in antibiotics. And Terramycin's got it. It's the only broad-spectrum farm antibiotic with the unique hydrogen-hydroxyl pair (circled at left) that helps protect stability . . . helps you make sure you get the potent antibiotic you paid for.

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# Report from Thailand

By William H. Hessler

BANGKOK—Some 75 hot, dusty miles northeast of this Thai capital, one comes to the village of Pakchong, a sun-baked sprawl of wood houses, shacks and thatched huts. Close by is a well-ordered truck farm of 15 rai, or almost seven acres. It belongs to a friendly young Thai with the formidable name of M. R. Parcharjakornvaravon.

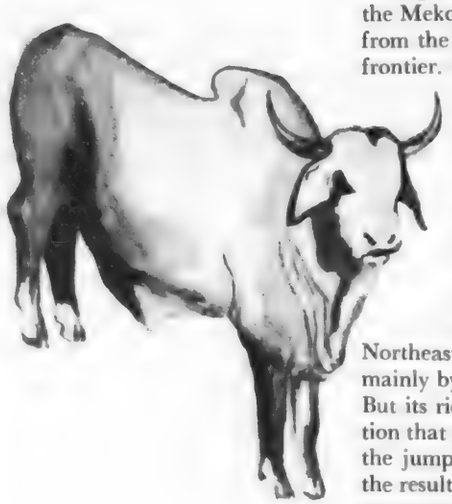
The M.R. is a title, indicating royal blood two generations back. (Royal titles diminish in rank with each generation, and after five they disappear.) This young man is a nephew of Prince Wan, the most eminent and polished of Thai statesmen. But he turned from railway engineering, his father's profession, and became a farmer.

Happily, he was rechristened Sam during a year in the United States, working on a farm near Burlington, New Jersey. And this I find a great help in talking with him and writing about him. Sam was the guest of U. S. farm organizations and the State Department. He worked hard on the farm in New Jersey, but also had a tour of the U.S.A., including Washington, D.C. At the Smithsonian Institution, he was fascinated by a model of an American frontier farmstead. And this was important in his life, as we shall see.

To Sam's good fortune, his older brother gave him the 15 rai near Pakchong. With enormous energy and a good eye for business Sam built it into a good truck farm. He has a power pump to water his land from an adjacent stream that flows the year round. By starting each crop well before the last is harvested, alternating grain and vegetables, he grows five crops a year—something he did *not* learn in New Jersey.

To Sam's further good fortune, the American International Cooperation Administration (ICA) came along and joined the Thai government in building what is now called Friendship Highway—a stretch of excellent paved road some 85 miles long, from Saraburi to Korat—and right past Sam's 15 rai. The road was justified as defense support aid because it is the main highway into the Northeast, connecting with a further road that leads to Nongkai, on the Mekong River and the Laos frontier.

Western support for Laos has been carried on in great part by air, through Bangkok. But if Thailand's own army is to be effective at the Mekong frontier, in some future crisis, it will need good highways from the Bangkok area north and east to the defense zone along the frontier. A quite large share of U.S. aid to Thailand over the years has been earmarked for transportation, especially highways, with this defense problem uppermost in the minds of both Thai and U.S. military planners. But 99 percent of the vehicles that use it, year in and year out, are likely to be cars driven by farmers or businessmen, or trucks taking farm products to market. Except for some possible great emergency, the highway is for commerce, not defense.



But Thailand has *two* frontiers—the military frontier at the Mekong, which is in the headlines of the world's newspapers; and the economic frontier of the underdeveloped Northeast plateau. For centuries Thailand has lived and prospered mainly by growing rice on the great central plain north of Bangkok. But its rice economy will not sustain for many more years a population that suddenly has exploded after generations of stability. Mainly, the jump in population increase, now around 2.9 percent a year, is the result of steadily improved sanitation and medical services. Death rates are slashed, but birth rates remain high. Meantime, most Thai farmers knew only one way to make a livelihood, which was to grow rice. It had been the backbone of the national economy. It insured the whole population—25 million people—against the hunger prevailing in China to the north and India to the west. And it provided an enormous surplus for export—enough to generate half of Thailand's entire foreign exchange earnings. (Other major exports: rubber, tin, teak and, in very recent years, corn.)

But the delta of the Chao Phya River, ideal for paddy rice, is only

(*Continued on page* 96)

# $30 Soil Test Kit Brings Kansas Farmer $1500

## Soil Test Kit One of Best Investments Increased Yields 25 Percent, He Says

by Leo E. Dieker, Editor, The Hanover (Kansas) News

YOU'RE just kidding yourself if you don't test the soil in your fields to find out what types of fertilizer are needed before you plant your crops," says Tony Bruna, Hanover, Kansas, farmer. He reports obtaining excellent results on crop yields by use of his Sudbury Soil Test Kit.

Mr. Bruna owns 1000 acres of Washington County land, most of which is in the Little Blue River Valley. He and his four sons cultivate 410 acres and maintain an extensive livestock operation. Their principal crops are corn, wheat, oats and alfalfa.

"We always use the Sudbury Soil Test Kit and wouldn't think of planting expensive seed without first determining what the soil needed," he says.

Last year, he raised 10,000 bushels of corn on his four farms. On his irrigated fields in Little Blue Valley, the corn averaged 100 bushels an acre.

When Mr. Bruna purchased his fourth farm, it had been "run down." Before planting corn there, he and his sons used the Sudbury Soil Test Kit. Tests showed the greatest deficiency in phosphate, so this and mixed fertilizer were plowed in before planting and side dressings of nitrogen were applied during cultivation. This land, which formerly had only mediocre crops, yielded 90 bushels of corn an acre *without irrigation*.

Mr. Bruna became interested in the Sudbury Soil Test Kit after he had been told an alfalfa field needed limestone treatment. When $50 worth of limestone did "absolutely no good at all," he invested in a Sudbury Soil Test Kit. With it he found the soil needed nitrogen, not limestone. As a result of proper application of fertilizer, his alfalfa this year was a vigorous crop, knee-high on May 25, as shown in the photo below.

Use of the Sudbury Soil Test Kit has increased yields on Mr. Bruna's farms an average of 25 percent. Last year he had the finest corn crop he ever raised. "The soil test kit told me what treatment the land needed and increased my corn yield by more than $1500," he states. "This Soil Test Kit is one of the best investments I ever made. It has paid off."

Tony Bruna, Hanover, Kans., before one of 10 corn cribs on his four farms.

Knee-deep in alfalfa in May, Mr. Bruna dramatically demonstrates the effectiveness of soil testing. His Sudbury Kit told him the soil needed nitrogen.

## Farmers Lifetime SOIL TEST KIT

Takes only 10 minutes; costs less than 10c a test. Immediately tells lime (pH), nitrogen, phosphate, potash needs. You save fertilizer costs; increase productive capacity of your land. In no time you'll know more about your soil than you could otherwise learn in a lifetime of farming. Because it will make more money for you from everything you grow, you'll use it every season as long as you farm! Strong steel chest; instructions covering needs of 225 different crops. Lifetime Kit, like Tony Bruna's and other successful farmers, **$29.95**

## Now Is the Best Time to Test!

Now, when the memory of every area's performance is fresh, is the best time to test. Check those low-yield spots to find what was lacking. Test other areas to see what this year's crops removed from the soil. No samples to mail; no waiting for reports.

Tests are timely now, when soil is mellow and land is dry. It's easy to apply fertilizer now for spring as well as fall planting; prevents delays later, when you'll have less time. It's more economical, too; fertilizer costs less in fall.

## No Knowledge of Chemistry Needed

It's as easy to read as a thermometer. Your very first test will be accurate. Kit comes fully equipped for 300 tests. Well-illustrated instructions are easy to follow. It's so reliable county agents, vo-ag teachers, colleges, extension workers and successful farmers everywhere depend on it. You'll take it out into the field to make on-the-spot tests. *More than 500,000 kits are now in use!*

## SEND NO MONEY

Order your Sudbury Soil Test Kit C.O.D. plus postage—or send check and we will prepay, saving you from $1.91 to $3.55 in postal charges.

## BETTER CROPS GUARANTEE

*You Take No Risk!* If you don't get bigger, better crops with your Soil Test Kit next year, return it. We'll return your money. *That's how much confidence we have in our Kit and You!*

## MONEY-BACK GUARANTEE

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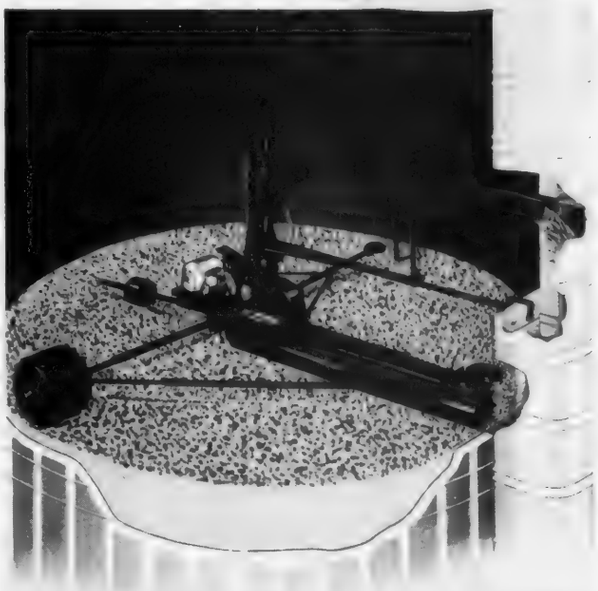

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# Epoxies

## FQ REPORT

**DESCRIPTION:** The epoxies are a group of complex, expensive, thermo-setting plastics with a wide range of farm uses.

**BACKGROUND:** The epoxies are a relatively new group of plastics. They have been widely used in industry for the past 6 years. The largest use is in paints, but uses are spreading. Two years ago they appeared on the general market, mainly as adhesives.

Three important properties differentiate them from other plastics. First, great strength. Second, great adhesion, making them excellent bonding agents. Third, once set, they are chemically inert, with great resistance to solvents, salts, water, acids and alkalies. Hence they make excellent protective coats. As adhesives they are unexcelled. They will bond metals, wood, masonite, stone and ceramics, and any combinations of these. As protective coats, they are used in industry because of their resistance to chemical attack. Expense is their only drawback. They make excellent paints, floor and wall coverings, and liners for many containers.

**CHEMISTRY:** Most epoxy compounds come in 2 parts, separately packaged, which *must* be mixed in the right proportion before use. There are a few one-component adhesives, but these require high temperatures—on the order of 250°F.—for cure, and there are a number of paints which are by custom called epoxies although no curing agent is required.

At room temperature the epoxy resin of a two-component system begins to react immediately on mixing so it must be used at once. Pot life varies, but a typical epoxy adhesive begins to stiffen in 30 minutes after mixing and will be hard in 4 hours. Maximum strength is attained in a week. Temperature, however, greatly affects these times. At 40°F. and below, practically no reaction takes place. The best working temperature is 60°F. to 100°F. When practical, a part cure with heat lamps (about 8″ from the surface) or in a 150°F. oven for an hour or two will improve final properties.

A pure epoxy resin, with a normal curing agent, may be quite brittle; and to overcome this disadvantage, special curing agents have been developed and special liquid modifiers are introduced into the resin. Most formulated epoxies contain the curing agents and modifiers best suited to a special range of applications. In addition, with the liquid, two-part systems, it is often good to introduce special fillers to regulate flow, lower cost, and improve certain cured properties. If you are working with a liquid epoxy system (which is light amber in color—or which has been pigmented—and has the consistency of warm honey) you may convert it to a paste or semipaste by addition of a filler such as powdered limestone, mica, sand, sawdust, concrete, etc., to extend the coverage without adversely affecting the cured properties. These inert substances may be added to pad the product when you don't need it, so it's essential to buy from a reputable dealer.

**ADHESIVE APPLICATIONS:** Epoxies make excellent bonding agents. Often the repaired crack or a new joint is stronger than the original unbroken piece. Epoxies have a tensile strength about ⅓ that of steel, and many times that of aluminum, wood or concrete. For maximum bond strength it is important to use the *RIGHT* epoxy, i.e., one designed for metals, or one for wood, etc. The joint must be clean, especially of oil or grease. A light sanding plus a solvent wipe is usually satisfactory. A thin layer of the epoxy is all that is necessary. Three mils thickness does as well as 30 mils, or 300 mils. Since epoxy is expensive it is senseless to waste it by heavy application. Especially important is "joint design". In wood-to-wood bonds, for example, dowels may be required, otherwise the joint will fail by splitting off the top layer of wood. In metal-to-metal bonds, be especially careful. If the joint is designed in such a way that it can be peeled back—like peeling the skin from a banana—the epoxy will likely fail under a very light load; whereas, if the joint is in straight tension (or is reinforced to prevent peel stresses from starting) a square-inch area will (conservatively) carry 3000 pounds. In all adhesives, it is essential to design the joint properly and to follow the manufacturers' recommendation on surface preparation and mixing. If the epoxy is not mixed thoroughly (vigorous mixing for about 3 minutes is usually adequate) or if there is more than a 10% error in proportions, the cured properties will suffer.

Many epoxies now sold are vastly overpriced, especially those sold in small quantities. A fair price for a 2½ lb. unit of epoxy adhesive for concrete is $4.50. It may be less than $1.00 per lb. for very large amounts. (The 2½ lb. unit contains separate packages of both the polymer and the curing agent in the right proportions.)

Epoxy adhesives are particularly interesting for use on concrete. The concrete should either be new, or thoroughly cleaned by sandblasting or chipping. A good epoxy joint in concrete will be far stronger than the concrete itself. For very small repairs pure epoxy may be used; for somewhat larger areas an epoxy concrete may be made up. The right epoxy may be mixed with sand and gravel, or sand alone, to make an epoxy concrete which contains no portland cement and which is about 3 times as strong as regular concrete. The proportions are 1 part of epoxy to 6 to 8 parts of sand, or sand and gravel. Epoxy concrete is strong but expensive.

A good epoxy adhesive use is in covering old concrete. If a concrete floor or wall is worn or cracked but still sound, an epoxy may be used to bond a new layer of concrete to the old. The old concrete is cleaned and a thin layer of epoxy spread over it. (A gallon of epoxy costing about $15 should cover 70-80 sq. ft.) Then, when the epoxy begins to be sticky, new concrete is placed on the surface. The epoxy and new concrete cure together, and the epoxy bonds the old and new concrete. The result is a slab of equal strength to a solid slab of the total thickness of old and new concrete. It means, in practice, that a 2″ cover may be placed on an existing 4″ slab of concrete to get the effective strength of a new 6″ slab. But a "moving crack" can't be repaired with epoxy. If a floor is not properly supported, a new crack will form after an epoxy bonding, though usually not along the old joint.

For any adhesive application, go to a reputable dealer and ask for a specific epoxy for a particular job. Beware of epoxies sold under labels which claim they will glue anything to anything. They may do so, but they will be many times weaker than a specific epoxy designed for the job. Remember, too, the repair, or new joint, is no stronger than the rest of the material, particularly in concrete. It is a waste to use epoxies on poor concrete.

**PROTECTIVE APPLICATIONS:** Epoxies make durable but expensive coatings or paints for floors, walls and roofs. They may be used to cover metal, concrete or wood.

Sand, bonded with epoxy to make an epoxy mortar, is an excellent, durable floor covering. Such coverings cost from 30¢ to $1.00 a square foot, depending on thickness—which depends on the service expected. By varying the amount of sand they can be slick and shiny, or nonslip. This work is best done by a skilled contractor who will guarantee his work.

Epoxy paints and troweling compounds may be used to protect all types of walls, but epoxies and epoxy protective coats are expensive and should be used only where their advantages outweigh their extra cost. Paints and protective coats cost $10-$12 a gallon. A gallon covers about 200 sq. ft. Because of their resistance to all types of chemicals they may be used on dairy walls, perhaps in farrowing pens and other places where sanitation is important. They are being used in silos, but there is a lot of controversy about the economics and practicability of their use in silos.

**EPOXIES IN SILOS:** Some companies recommend and sell concrete silos lined with a coating of epoxy about 1/16″ to 3/4″ troweled onto the new silo. The epoxy is usually applied on top of an epoxy primer layer, sometimes called a rebinder. This is definitely not recommended for old silos—only for new concrete. Wholesale cost of materials for a 14′x40′ silo will be roughly $250. This is definitely not a do-it-yourself project, however, but cost of this epoxy lining will be $250 to $400, applied, as many companies sell at cost.

Certain applications of the epoxy-lined silo are excellent. The epoxy lining makes the walls of the silo practically gas-tight; excellent for rice storage. Polished rice is stored under fumigation,

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using methylene chloride gas under pressure to control insects. Concrete silos without the epoxy lining have lost $30 worth of the fumigant gas per week through the porous walls. This was cut to $1.50 in an epoxy-lined silo.

In wet corn storage, too, an epoxy-lined silo may pay for itself very fast. If the epoxy lining prevented even 2" depth of spoilage over the entire inside surface of a 14'x40'silo, the saving would soon pay for the epoxy.

The controversy begins in the recommendation of epoxy-lined silos for regular silage: The proponents point to reduced spoilage; that silage will not stick to the epoxy walls and is unloaded easier; and that epoxy is very resistant to silage acids and gases. Opponents offer two arguments. The first point is economic; the second, chemical. They argue that a well-made concrete silo will last 10 years without treatment. After 10 years it can be treated with polystyrene, another plastic which penetrates and protects the concrete, but does not have as great adhesive powers as epoxy. Polystyrene costs about $60 for a 14'x40' silo, and lasts 6-8 years. To compete, an epoxy coat at $300 would have to last for 30 to 40 years. The oldest epoxy-lined silos are now 5 years old, though at least one has survived 7 fillings without signs of wear.

The opponents' chemical argument is simple. They claim there is a strong chance of the epoxy separating from the concrete. The epoxy, they point out, is much stronger than the concrete and rapid, wide temperature changes may cause epoxies to expand and contract at a different rate than the concrete. Furthermore, chemists can show internal stresses in epoxy resins independent of temperature change, and these, too, may cause a separation from the concrete.

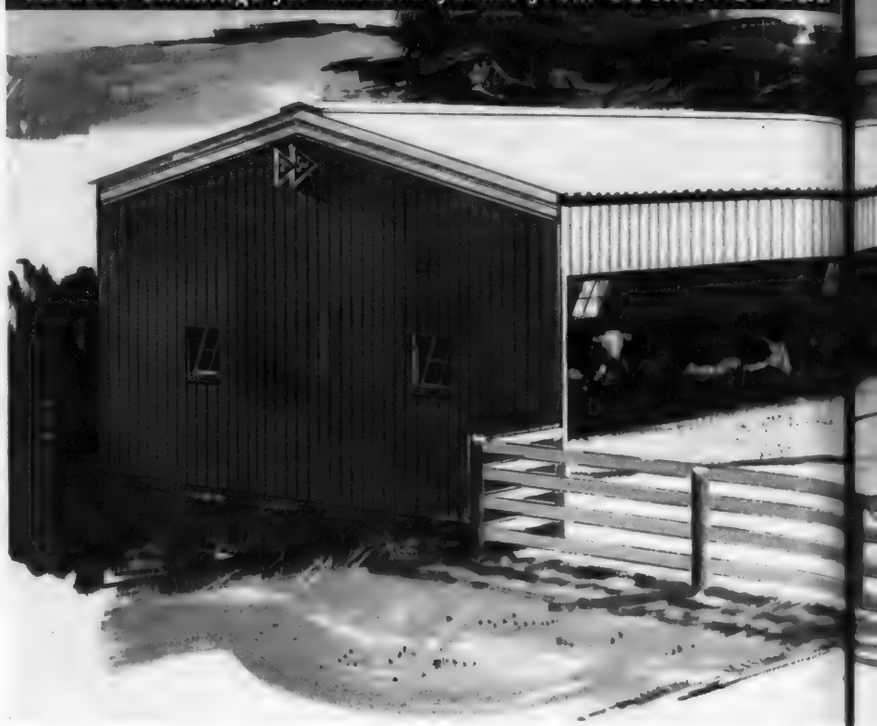
All parties agree, however, the epoxy-lined silo is no better than the concrete from which it is made. The concrete, not the epoxy, is the weak link in the chain.

One silo application which has proved good is the use of epoxy as a grout to hold concrete or tile staves together in a silo. Here the epoxy is an adhesive rather than a protective coat, and its adhesive properties have been well proven.

**ODD USES:** A Kentucky veterinarian has used epoxy to mend quarter cracks in horses' hooves; the Air Force uses tons of epoxy concrete to repair runways where loose concrete was being sucked up into jet engines; it is used to repair the cracks in trees; swimming pools can be lined with almost any color epoxy; one farmer lined corroded metal chicken waterers with epoxy paint.

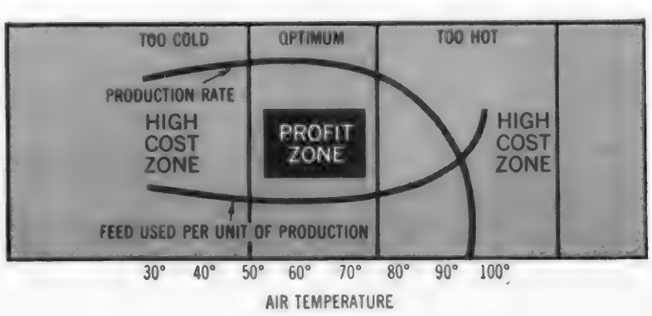
**SAFETY:** Avoid contact with the compounds during application.. Use gloves, long sleeves, and goggles when indoors. A few people are allergic to epoxies. They should never use them. No protection will prevent them from reacting—usually with a dermatitis rather like that caused by poison ivy. If you get one, avoid further contact, and use Burrows' solution to relieve itching. It will disappear in a day or two. If not, see a doctor.

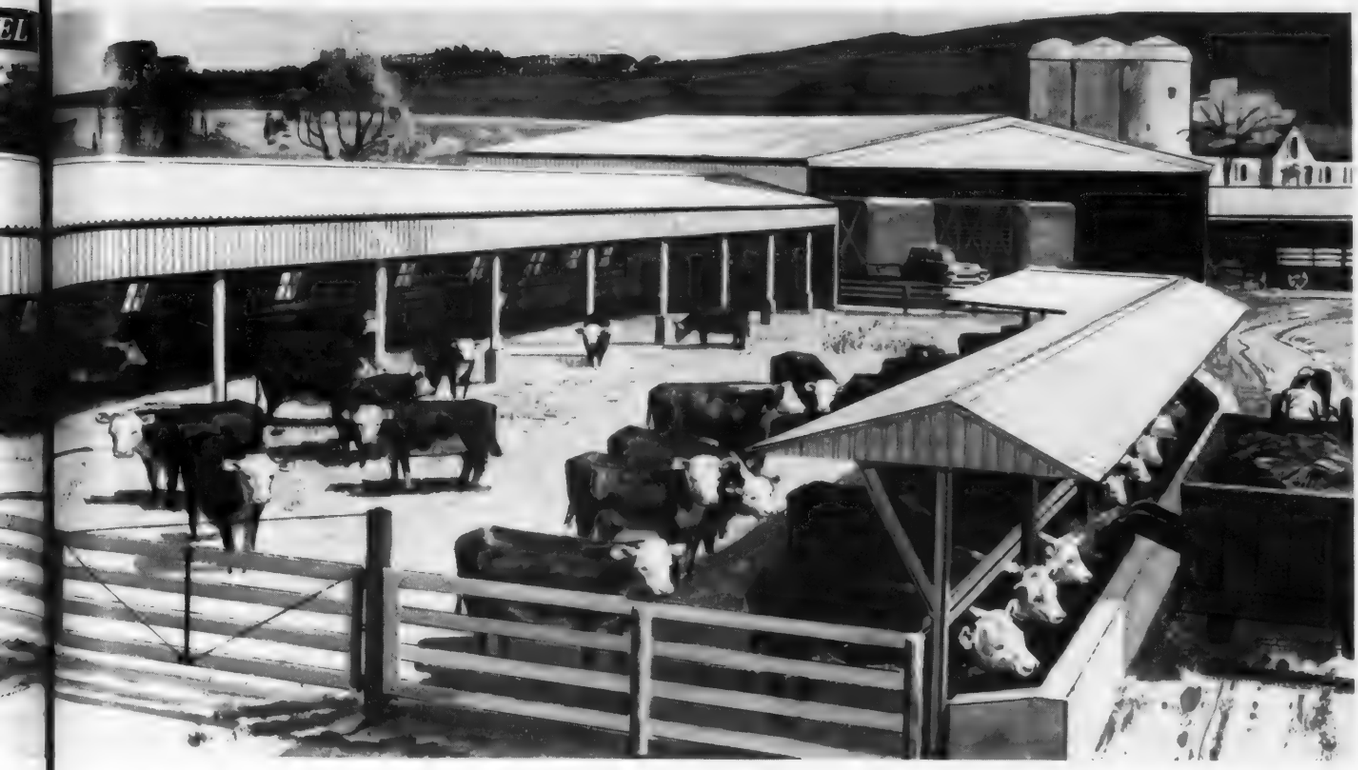

*Modern buildings for modern farms from STRAN-STEEL*



# HOW TO PUT MORE BEEF ON EVERY HEAD SUMMER AND WINTER

## (and do it on less feed)

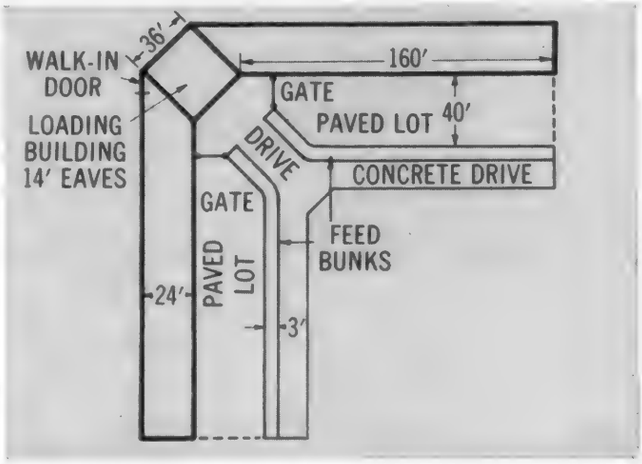




Sound feedlot management has been quick to recognize the Stran-Master shelter system as one of the keys to bigger profits. In fact, it can be as important as forage-grain programs, cattle-feed additives and other advances in modern beef production. The reason is that adequate shelter protects animals against cold and heat extremes, crowding, disease and muddy conditions. And whenever these conditions exist on feedlots, production declines, costs go up and profits take a beating, too. These are the reasons why cattlemen can lose money even in times of good prices, can really go in the red when offerings are slim.

**SOLUTION: A STRAN-MASTER BEEF SETUP**

Here's a typical beef production setup for self-unloading wagon feeding that can increase gains, cut feed costs and labor, too. It's a Stran-Steel solution for a feedlot that feeds out 450 steers at one time. It offers a 32′ x 36′ entrance house approaching the feedlot, plus two 160′ wings on the north and west sides. This provides excellent protection against prevailing winter winds to prevent steers from wasting feed just to keep warm. In summer, the heat-reflecting white Stran-Satin roof keeps livestock more comfortable to increase feed intake and weight gains (see temperature chart). In fact, university studies show that shaded cattle can bring as much as $5 more per head in a normal season. The entrance house and door are high enough to allow auger feed wagons and livestock trucks to pass through with ease. Wings are 24′ deep, giving steers plenty of resting space—especially important for feeder calves and yearlings fresh off the open range. And the side wings can be easily extended for future expansion. Inside the lot, feed bunks are completely accessible to mechanized type feed wagons. And this Stran-Master system is easily adaptable to fixed auger feeding, too. The results? With good management, this minimum-stress feedlot requires fewer man-days of work to finish your herds for market. You get more uniform lots of animals, more attractive prices, better profits.




**ARE STRAN-STEEL BUILDINGS EXPENSIVE?**

Stran-Master prices are surprisingly low in relation to your production costs. The feedlot shown here, for example, priced out about 10-12% of unit production costs per hundredweight—a small amount. And that includes the building, erection, all equipment, utilities, depreciation, taxes and insurance. Your local Stran-Steel dealer can give you cost details for your needs. Through his Personalized Building Service, he can plan, build, equip, even finance your purchase—for just 25% down and five years on the balance. You'll get a choice of 10 Stran-Satin colors that beautify and protect your building. And your Stran-Steel dealer can have it up and earning for you in a matter of weeks. Call him soon or mail the coupon below for details.

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**Ford F-350 features dual rear tires** and a big 9-foot stake body at a price much below 1½-ton trucks.

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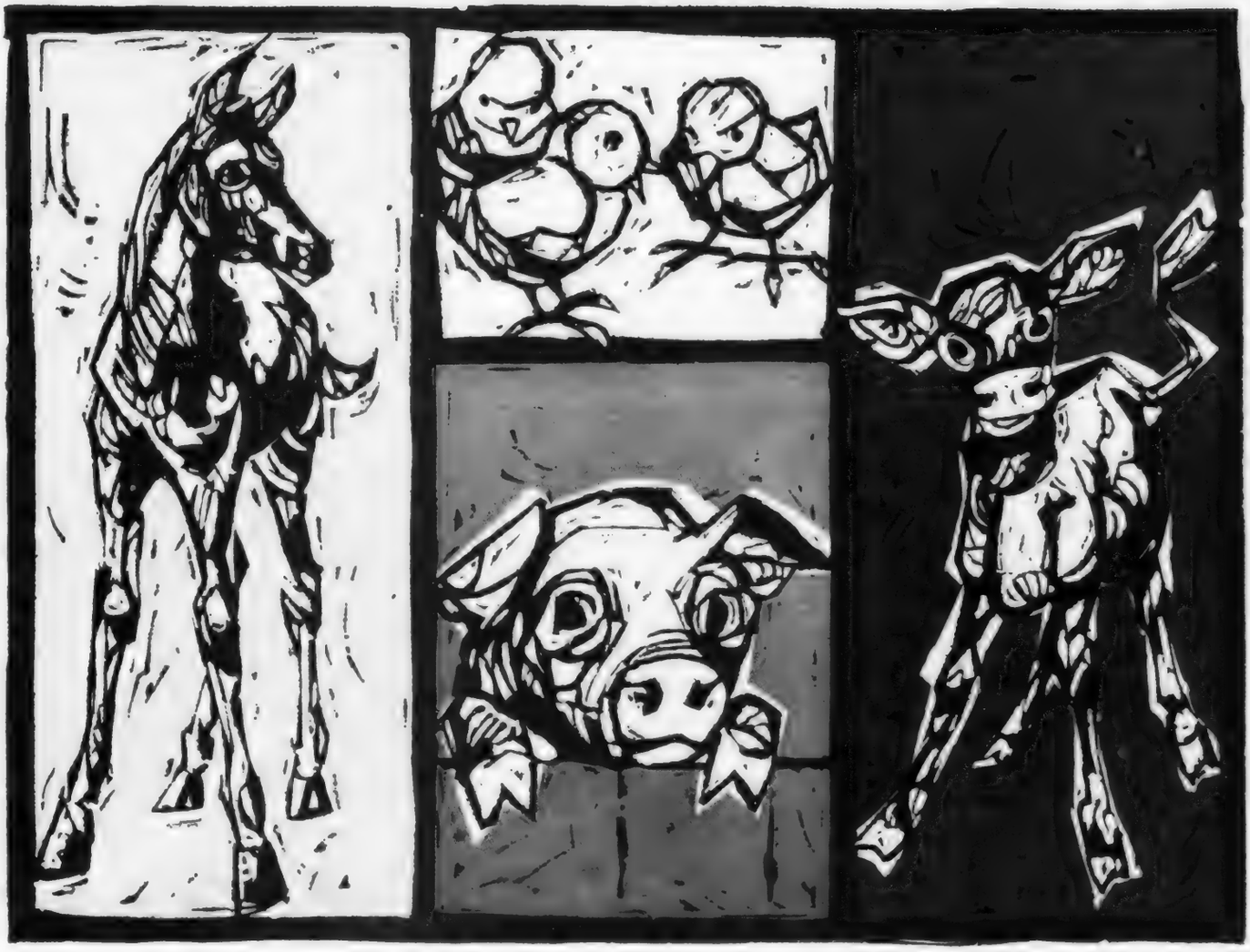

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Vitamin-rich 'Clovite' is the ideal health booster for all young stock. It helps calves, pigs, lambs, foals, chicks and poults get off to a sturdy, disease-resistant start. 'Clovite' mixes readily with all types of farm feeds. Actually improves their palatability. Rich in vitamins A, D and $B_{12}$. Also supplies thiamine, riboflavin, niacin, choline and pantothenic acid. Daily feeding of 'Clovite' helps promote health, build disease resistance and speed growth.

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Available through veterinarians everywhere in 25 lb. pails and 100 lb. drums. The amount of 'Clovite' to use depends on the vitamin needs of the individual animals or flock, and your veterinarian is qualified to give specific feeding advice.

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# Diversification

# Saved Us

## But high costs, low prices, taxes, and inflation could scuttle this ranch.

By Charles R. Koch

**Leaning back against his desk, general manager Don Tavenner (above) analyzes the economics of combining sheep, beef cattle, dairy and swine enterprises on the 50,000-acre Williams and Tavenner ranch. In such operations everything is on a big scale. Alfalfa silage is chopped into a hydraulic lift tank which dumps it into a truck (opposite page) for delivery to a huge trench silo. Almost 2400 acres of forage crops are either ensiled in this manner or cut and baled as hay.**

THE WILLIAMS AND TAVENNER RANCH, 50,000 acres of the finest grassland in Montana's Deer Lodge Valley, runs a sizable band of sheep; has a yearling beef enterprise, based up on a cow herd of upwards of 600 head; operates a 100-cow dairy; farrows each of some 70 sows yearly on a multiple farrowing basis and feeds out the resulting pigs; and, on irrigated fields, raises all the hay, the silage—corn and alfalfa—and a large part of the small grain it takes to feed this vast array of livestock.

This diversification has been resorted to in an effort to free the ranch from the sorry consequences of declining markets in any one of the enterprises mentioned. The management has generations of ranching experience behind it. They have cut costs and followed the admonition to expand. But still they find themselves at the mercy of elements beyond their control—low prices, inflation, and taxes. These are the pressing problems of every farmer and rancher today, large or small.

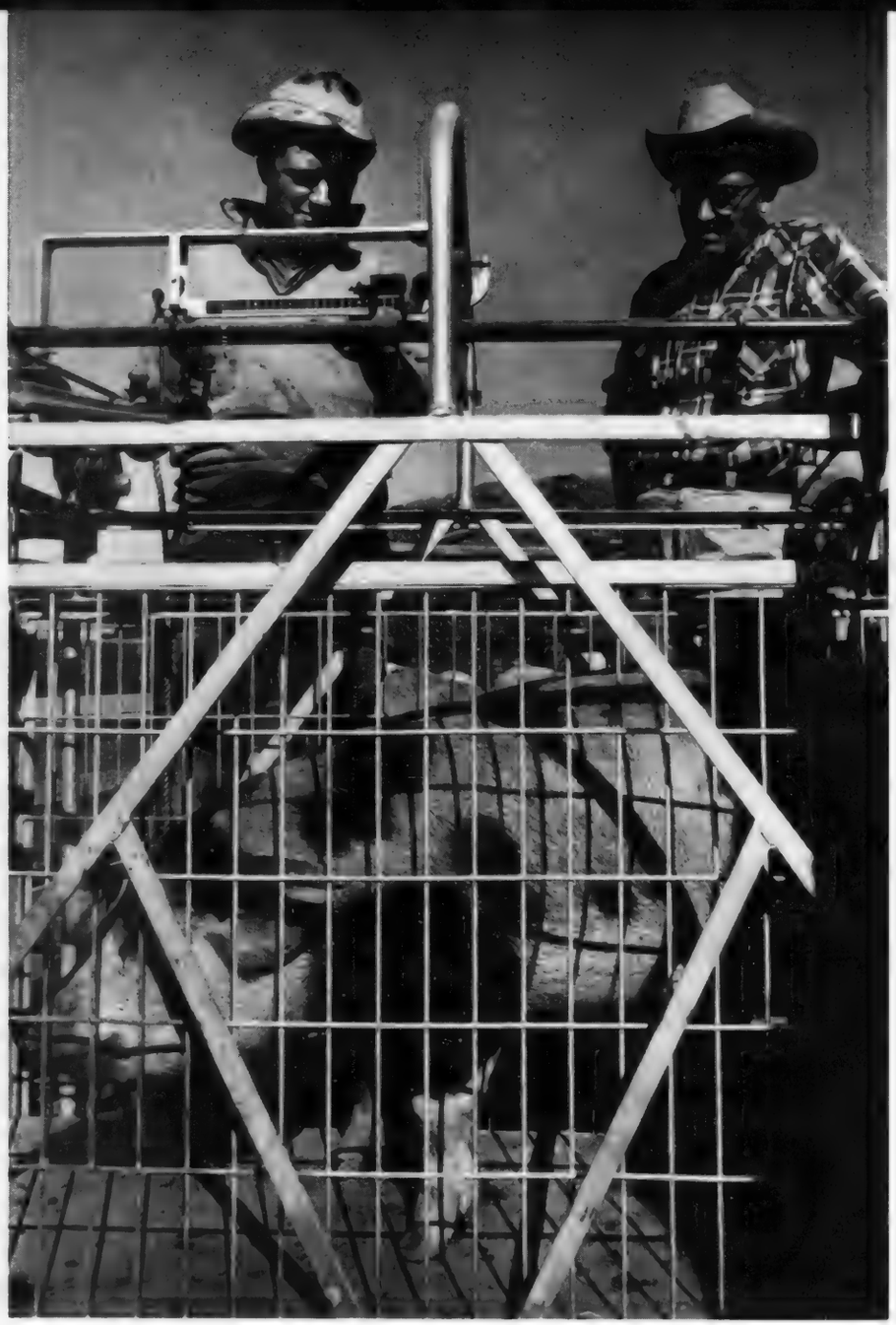
Sheep, the business of producing the very best Rambouillet rams for range bands, brought the ranch into being and made it what it is today. "Everything you see here," Don Tavenner said as we returned to headquarters after checking some of the irrigation ditches one beautiful day last spring, "everything — the houses, the barns, the office, the machinery and the other livestock —is here because of the sheep." Big, six-foot-three Don Tavenner is the driving general manager of the spread which was started almost 80 years ago by his grandfather, Charles H. Williams, himself but lately removed from Iowa at that time. Around the turn of the century Williams, who later became a state senator, took into partnership his French sheep herder, William Pauly. Of this combination, E. N. Wentworth notes in his book, *America's Sheep Trails* that "when the Rambouillets came into ascendancy, the flock of Williams and Pauly, more than any other in the entire United States, developed enough purebred bands to provide long strings of rams for large purchasers and distributed its bucks from Canada to Texas and Mexico."

By 1949, the Williams and Pauly ranch had grown to more than 110,000 acres, operated now by the heirs of the original partners. This setup, representing two distinct families with many ramifications, was becoming ever more cumbersome from a management standpoint. So the ranch was split, the Williams family and the Pauly family each getting roughly equal shares of the land. Today the Pauly ranch, under the management of Sylvan Pauly, and the Williams and Tavenner Ranch still operate side by side, sharing the same water and maintaining some 25 miles of common fence.

Don Tavenner is a quiet-spoken, serious individual. He studied business administration at the University of Washington, is president of the Montana Wool Growers Association, a member of the executive committee of the National Wool Growers Association, and president of the Rocky Mountain Association D.H.I.A. When he takes off his glasses and rubs his eyes you know you are about to get a thoughtful observation on some phase of the ranch business. Or maybe this gesture will be the prelude to a probing question, like "Why is ranching becoming merely a gimmick for the outsider looking for a tax writeoff?"

The ranch is owned by a family corporation of five stockholders. Lee Williams, Don's uncle and president of the Deer Lodge Bank and Trust, is president. Don's brother Bob is secretary-treasurer. Don, his wife Mary, and Ruth, Bob's wife, are the other stockholders. As general manager, Don oversees the sheep, cattle, dairy, swine and farming operations. But brother-in-law Nick Bielenberg is directly in charge of the sheep; Howard Robbins is Don's right-hand

A barley-fed hog tips the beam at market weight as Bill Heltborg and the boss register satisfaction (right). Part of the high producing Holstein dairy herd gets its morning hay ration (below).



Later, as the dusk closes in, the cowboys ease a bunch of long yearlings to the railroad siding (bottom) to start their trip to the feedlot and bring the payoff to the annual routine of calving, tagging, branding and grazing.

man on the beef herd; Bill Heltborg handles the details of the dairy and swine operations; and brother Bob tackles—and does a right capable job of solving—the endless mechanical and engineering problems connected with an outfit of this size. These include keeping the two-way ranch radio system in operation; servicing an even dozen trucks, from pickups to big semi-trailers, a baker's dozen tractors, and an endless variety of equipment to go with them; laying out and maintaining a system of irrigation ditches measured by scores of miles, together with all the headgates, weirs and valves which are part of such a system; keeping the buildings in repair; maintaining scores of bridges and hundreds of miles of roads and fences—and opening the pipe when the kitchen sink clogs up.

### Sheep

A year ago the Williams and Tavenner Ranch had in operation one of the most advanced systems in the country for recording the wool and lamb production of its sheep flock. Based on these records they maintained a select flock-within-the-flock of blue chip sheep from which they offered their range customers yearling rams with solidly established genetic potential. (See "Blue Chip Sheep," THE FARM QUARTERLY, Summer, 1960.) Today that program is dead. "With feeder lambs at 14 cents, we just can't afford it any more," Don said. Then he went on to detail the last days of the program.

Nick Bielenberg took 40 yearlings to the Casper ram sale last fall; some of the best the ranch had ever produced. After ten had brought a meager $25 per head, he loaded up the remainder and headed for home. Eventually he sold them all to old customers along the way—at prices well below the cost of production. Then came the decision on whether to get out of the sheep business or to stay in it, and to what extent. "This is where diversification saved us," Don said. "If we hadn't added other enterprises years back, we wouldn't be here today."

**Sheep, purebred Rambouillets, were the foundation of the Williams and Tavenner ranch. Shearing is a late winter job and the shorn ewes present a chilly sight as they follow the herder and a bellwether past the ranch headquarters.**

The ewe flock was cut in half. It now numbers 1,200 head of the better ewes. The record program was dropped. Then this spring Nick and Don found themselves faced with the most drastic decision of all: What to do with the ram lambs? For well over a half century this ranch has been offering the range trade the best Rambouillet yearling bucks. Could they afford to continue in the business? The answer after a long, hard look from every angle was no.

"I don't know what's happened to the sheep business," Don said, "but regardless of the cause, it's gone to pot. When depression hits the sheep business, the ram business falls apart with it. We've weathered plenty of bad years before, but it seemed like there was always hope for a comeback. That isn't the case now."

He went on to itemize some of the factors which led to their decision. Ewe lambs, in times when costs were much below current levels, used to bring 35 cents a pound. Some of the best ewe lambs in the West went for 16 cents last fall. Feeder customers, most of whom have lost $3 to $5 per head on every lamb that went through their lots the past few years, are going to be mighty hard to do business with this fall.

The trend is definitely away from the range sheep business. Government policy on forest leases is ever more restrictive. Costs are high, herders and camp tenders are scarce or nonexistent, and the problems of shearing large bands with union crews involve more than the high cost per head (35-cent minimum).

Such annoyances, for example, as a crew quitting right on the dot at five o'clock with only a handful of ewes still to be shorn. The entire band must then be turned back with the lambs from which they have been separated since morning, then the lambs and ewes must go through the confusion of separation again the next morning. This is one hazard Nick Bielenberg has eliminated by shearing the ewes before lambing.

"Had we decided to continue in the yearling ram business," Don pointed out, "it would have meant leaving ourselves open for 18 months with no prospect of better prices. By cutting the rams we will run only one band and can dispense with the services of a buck herder. And we have given up our forest leases in the White Sulphur country. This is going to save us a considerable piece of money in rentals and transportation."

But the ranch will still have several hundred yearling rams to sell this fall. These are from the lamb crop of 1960; and they have probably been given more care than any rams that ever left the ranch. As Nick Bielenberg observed this spring, "If a lamb is going to be worth anything at all on the fall market he's going to have to be tops." So all the rams were grained this winter on a mixture of oats, barley and corn, one-third of each ingredient by weight. Each ram consumed about three pounds a day.

Many of these rams are dehorned, too. Nick has become adept at using the hot iron on the very young lambs and the results have been excellent. Regardless of prices, the Williams and Tavenner offering this fall will still represent real quality.

### And Cattle

The decline of sheep numbers on the ranch demanded replacements of another type. So 328 calves were purchased last fall and added to the home-raised cattle. All calves on the ranch are weighed in the fall and again in the spring when they are turned out on range. The scales this spring revealed the clear-cut superiority of the Williams and Tavenner breeding system.

The purchased steers had come through the winter with individual gains of 66.6

pounds; the homebreds had gained 99.4 pounds. Both groups had been wintered on the same rations—14 pounds of alfalfa-grass silage, two pounds of a mixture of barley and corn, and hay at the rate of about eight pounds per day.

Regardless of the fact that shipping and the problem of adjustment to their new environment may have placed the purchased calves at a disadvantage (none of them had been shipped more than 150 miles and all were on the ranch for weeks before the feeding period started), this was far from sufficient to account for the 50 percent greater gains made by the homebreds.

The difference was undoubtedly due in large part to the ranch's breeding and performance testing programs, the latter in operation since 1956. Senator Williams originally started in the cattle business with Shorthorns—Durhams in those days. In 1930, the ranch switched to Herefords and the herd has been white-faced ever since. These are commercial cattle. Several Miles City Line 1 bulls have left their stamp on the herd. Registration papers have little value here, but the performance figures are recorded with the greatest care, Don Tavenner personally entering all the weights and grades on the cards and ledger sheets.

A production card prepared by the Montana Beef Cattle Performance Registration Association is kept for each of the 600 or more cows in the herd. This card shows the age of the cow, her sire, dam, breeder, registration number and tattoo mark. Below this is space to enter the performance records of each of her calves, including their birth date, weight, weaning weight, yearling weight and the gains and index of gains between each of these periods.

Sheets from what Don calls his field book show the following information for each calf: eartag number, sex, dam, birth date, weight and grade; weaning grade, weight, and adjusted weight for 220 days; spring turnout weight, winter gain, adjusted weight for 400 days, and grade; sale weight, grade and date; and remarks.

Under "remarks" come such notations as "line back," "red neck," and other bits of information which might serve as a basis for selection or culling.

These two records, the cow cards and the field books, are essential. No record of performance system can be run without the one to check against the other. Besides these, a sheet is also kept on the bulls which are weighed every 28 days while on a feedlot rate of gain test.

"Because of seasonal differences—the influence of a year of good grass and moisture compared with a dry year, for example," Don said, "we can't positively credit our performance testing work with giving us heavier weaning weights or heavier yearlings. But we are getting more pounds of beef from the herd, we've improved our quality, and our cattle are more uniform.

"And speaking of uniformity, I know a red neck or a line back can produce as much beef as his better marked brothers. But he breaks up the uniformity of the bunch, and gives the buyer an opportunity to dicker on price. That we can't afford.

"Never have we weighed a set of calves but we've found one gaining twice as much as one of his poorer herd mates. It's this better kind we want to repeat."

And how do they use these records to build a better herd? That depends. There is always what might be called automatic culling in a herd. Age, accident, and physical defects take their percentage of cows every year. So if a herd is on the buildup, further culling is definitely restricted. If the herd size is static, though, the records become a most important tool in selecting replacement heifers. "A man lives with his old cows," Don explained, "and picks his heifers from the records." All replacement bulls, too, are selected on the basis of their records. An offshoot of this work has been the sale of breeding bulls.

In 1956 the ranch had only five bulls on index. This year 45 completed the test. Five of these yearlings exceeded 1,000 pounds each at the end of the 140-day feeding period; and all five of these came from selected heifers.

Some of the best grading calves on the ranch are from first calf heifers selected on the basis of their records.

"If performance testing does nothing else for a breeder it makes him more conscious of details," Don contends. "He has to take a careful look at every individual in the herd at least twice a year and note its weight and performance in comparison with the rest of the bunch. This is going to make him cast an eye on every factor that might cause fluctuations in those figures, even such things as shelter, water, condition of the grass and location of fences."

### Cows—and Milk, Too

"One of the things about us that always seems to puzzle our PCA is how we maintain such a big loan and pay relatively so little interest," Don said. "The secret is our dairy. Those twice-monthly milk checks are as big a help on an operation like this as they are to a man whose sole income is from a 25-cow herd. They help us to make continual payments on our loan."

The ranch got into dairying about seven years ago. Up to that time they had always had a few cows to supply the milk needed for the ranch personnel. Cream was sold and the milk kept for use on the place. "Our choreman was always grouchy and out of sorts," Don recalled, "and with good reason, I suppose, considering the kind of setup he had. So we finally decided we'd sell the cows or do it right.

"Bill Heltborg was farming and milking cows over across the valley and he always had his tongue hanging out trying to catch up with his work. So one day I propositioned him to sell his cows and come to work for us. He took me up. We bought his herd and sold him some ewes for his place, and he has been running our dairy ever since."

Besides the Heltborg herd, they bought two other top herds at dispersals and were in business. Their 100 or so cows are grade Holsteins with an average production of more than 11,000 pounds of milk and 400 pounds of butterfat.

Loose housing is used. Milking is twice a day, beginning at 2:30 in the morning and again at 2:30 in the afternoon. Heltborg and two helpers attend to this chore in a five-stall, U-shaped parlor with a pipeline milker. Schedules are arranged so each man has one day off a week.

The dairy ration is a mixture of 2200 pounds of barley, 200 pounds of sugar beet pulp and 100 pounds of soybean meal. Consumption is on a 1:4 ration (1 lb. of grain per 4 lb. milk), plus about 15 pounds of corn silage.

Artificial insemination is practiced in the herd to only a limited extent, the greater part of the breeding role being assigned to top bulls which the ranch has acquired from the Huntley Experiment Station at Huntley, Montana.

All calves are taken from their dams at birth, and despite the severity of the

(*Continued on page* 131)

Mile upon mile of ditches must be kept in repair to bring irrigation water from a mountain lake to the ranch's valley fields. The power shovel (above) is indispensable for this job. Bob Tavenner (left) is in charge of this and all other engineering and mechanical projects on the ranch.

# Timing Swine Feed Additives

## The age of the hog affects the economy of their use.

By Frank Klein

THE RIGHT ADDITIVE fed at the right time is profitable. In practice, trace minerals return as much as $300 per dollar invested. A wrongly-timed additive in the hog ration is less profitable than pennies in a wishing well, for it probably won't even bring good luck. At any rate, timing swine feed additives should not be a matter of luck. Dr. Damon V. Catron and Francis Diaz, swine nutrition specialists with an economic bent of mind, worked out some facts and figures for the profit-conscious hogman who wants to know when an additive will bring worthwhile returns.

They point out that each of the 11 commonly fed groups of additives have specific functions, as the table at the top of page 55 shows. The table below it reveals the variation in performance and returns on investment among hogs fed additives at differing growth stages. Thyroprotein, for example, is more valuable in the ration of lactating sows than in baby pig food. The opposite is true for enzymes.

### Management

"I would like to say at the outset," Diaz commented, when asked about the value of additives, "that they should not be depended on for doing a job by themselves. Good management needs to go with it. Take the stress caused by castration or vaccination. These operations recently have become danger signals for gut edema, a disease caused by bacteria which release a poison into the nervous system, often killing pigs within three to four hours. A good manager tries to reduce the stress by feeding only grains (no extra protein) for three or four days after vaccination or castration. If he also feeds antibiotics he will probably have double protection."

There are cases where shooting the works on additives to relieve stress makes sense. For example, a ration well supplemented can be a great help in getting feeder pigs started right in a new home after being trucked in. "But," as Dr. Catron said, "a producer should not let down his guard just because he puts additives in the hog ration." Generally it pays to feed each additive for a specific purpose.

### Trace Minerals

Essential trace minerals normally added to the pig ration are iron, copper, cobalt, manganese, zinc, and iodine. Mineral deficiency became a common threat rather recently. When pigs farrowed on pasture they'd start rooting around in the soil early enough to pick up essential minerals, except where the soil was unusually deficient. Pigs that spend a lifetime on concrete must have trace minerals in the feed.

That trace minerals have become an essential part of the pig diet makes it obvious that they are profitable to feed at all stages of a pig's growth. They differ from important non-essential additives, like antibiotics, which at some stages of hog life can profitably be left out of the ration.

Knowing the returns from feeding trace minerals, therefore, takes on the aspect of showing when in life a pig can least afford to do without. To this end, Dr. Catron and Francis Diaz went through their own records, developed at their former position with the animal husbandry department at Iowa State University, and at their present job as nutrition specialists for Walnut Grove Products Corporation, Atlantic, Iowa. They then combined their findings with reports from agricultural experiment stations throughout the country.

The resulting averages show the greatest returns from feeding trace minerals is in pre-starter and starter rations for the 10- to 50-pound pig. They bring an extra 3.2 pounds of gain, on one less pound of feed per pig. The cost of the additive is 4/10 cent per pig and the gross return $1.23 per head. That's $307.50 per dollar invested.

The next most profitable time for feeding trace minerals is from the time sows are bred till their pigs are weaned. The returns are due to an increase of 14.5 percent in litter size (an average of 0.9 extra pigs) and an increase of 23.4 percent in the weight of the litter at weaning (39 extra pounds). The cost of trace minerals runs 19 cents per sow plus litter, or 2.4 cents per pig. The total value of the gains is $14.23 per litter, or $74.89 per dollar invested.

Third in rank for providing returns from trace minerals is the period between 100 pounds and market weight. Feeding the minerals gets pigs ready for market seven days earlier and saves 17 pounds of feed per hundredweight of pigs marketed. The cost per pig is four cents, the return per pig is 80 cents, the return per dollar invested is $20. Possible income from marketing pigs one week earlier is not figured.

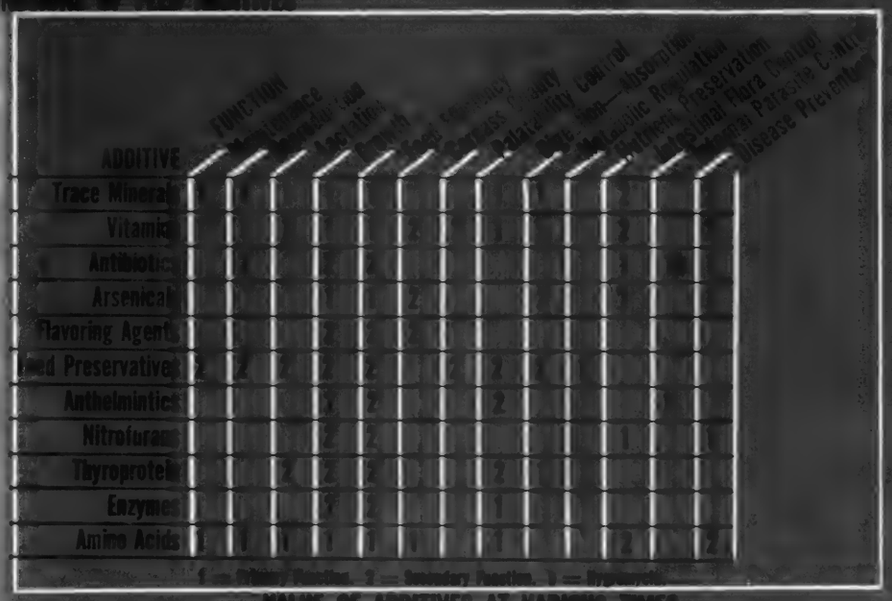
### Vitamins

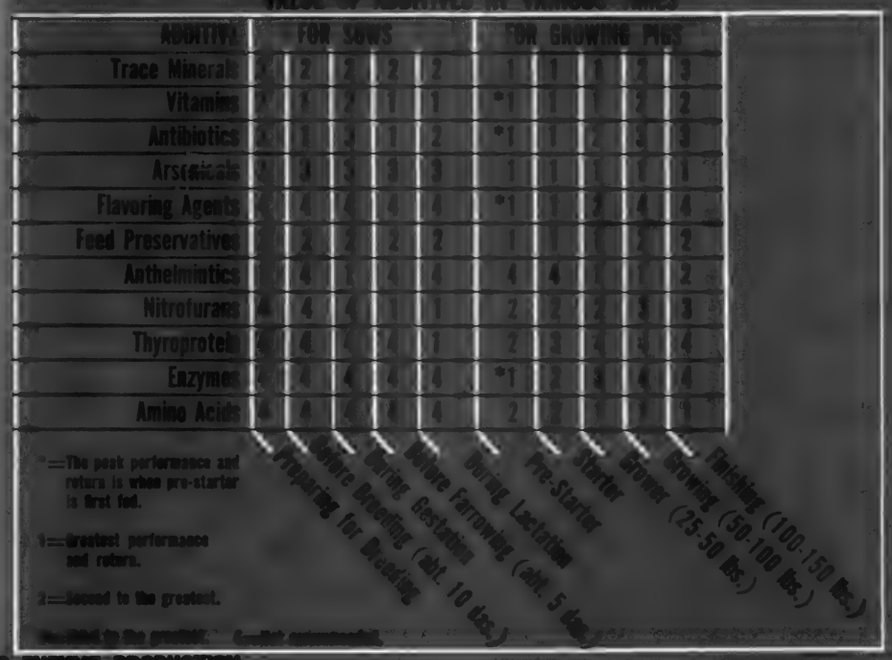
Essential vitamins are fed with profit regardless of life stages, much the same way as essential trace minerals. They are vitamins A, $B_2$, $B_{12}$, riboflavin, niacin, pantothenic acid, and choline chloride. Folic acid is a further additive for baby pig rations and, depending on the other ingredients of the starter, pyridoxine and thiamine are also needed. Baby pigs should be fed more of each vitamin than older animals because they need vitamins more, and they eat less. Vitamin D is an important additive for winter rations, particularly if high-quality alfalfa hay is not provided in the ration.

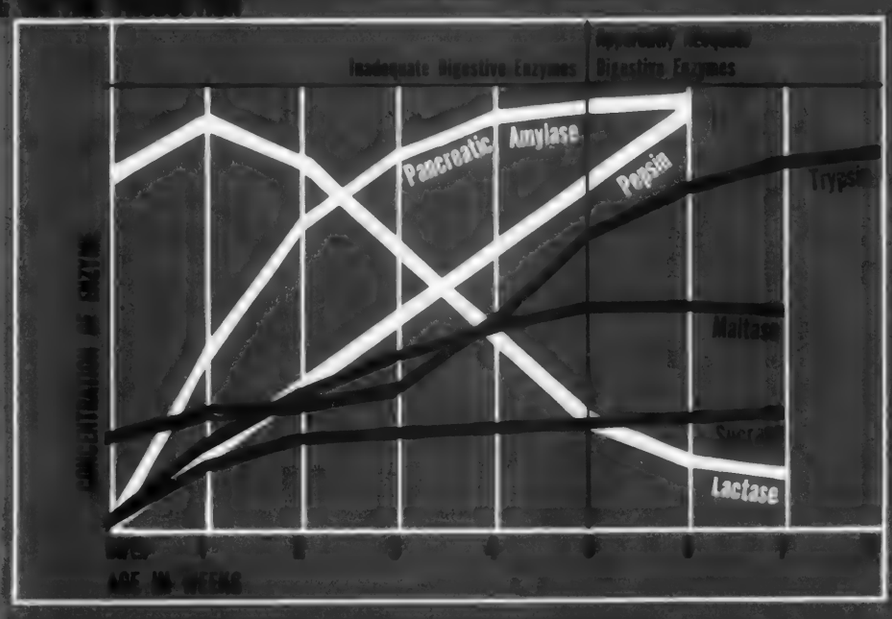
### Antibiotics

There are two main types of antibiotics. The first includes the tetracyclines. They are known as wide-spectrum antibiotics because they act against a greater variety of organisms. Unlike narrow-spectrum antibiotics they can be absorbed from the gut, and enter the bloodstream. The tetracyclines include chlortetracyline (CTC), oxytetracycline (OTC), aureomycin, and terramycin. Common narrow-spectrum antibiotics, which act inside the gut, include penicillin, bacitracin, and streptomycin.

Since they are not nutrients, it's sometimes profitable to leave antibiotics out of the ration. Rations without antibiotics, for example, encourage sows to build up a good supply of natural antibodies for the colostrum. (High stress periods before breeding and farrowing are exceptions.)




Antibiotics, nonetheless, do contribute to good nutrition. They reduce the amount of essential nutrients wasted during digestion and recombination in the body. This is called a nutrient-sparing effect. Each antibiotic spares specific feed essentials. For example, aureomycin spares three vitamins—pantothenic acid, riboflavin and niacin—in a growing-finishing pig.

### Profitability

The compilations by Dr. Catron show that the greatest profit from feeding antibiotics is in the pre-starter and starter rations till pigs weigh 25 pounds. Baby pigs weaned at three weeks gain an average of three extra pounds (an increase of 11.9 percent) with 50 milligrams of antibiotics in the ration. They require 5.8 pounds (11.4 percent) less feed compared with pigs not on antibiotics. In hard cash this means a gross return of $1.22 per pig on an investment of 32 cents per head, or $4.81 per dollar invested.

Feeding antibiotics to sows near farrowing is almost as profitable. The total effect is 49 extra pounds per litter weaned, a 22.1 percent increase. This is worth $11.77. The expenses for antibiotics, about 25 milligrams per pound of feed, are $2.80 per sow; total return per dollar invested, $4.20.

These returns are the result of less infection in the uterus, fewer farrowing troubles, and less mastitis. The sow is started on anti-

(*Continued on page* 124)

**The top table on this page reflects present-day knowledge about the effects of various additives. The second table summarizes the value of each additive at various stages in the hog life cycle from the standpoint of performance and returns per dollar invested. It is *not* meant to be a comparison *between* additives. A listing of "not recommended" does not necessarily indicate a use that is worthless or harmful. In many cases it means a timing on which no research has been done; or for which the cost is prohibitive; or regarding which no food and drug clearance has been given. The bottom table shows the rate at which enzymes naturally develop in baby pigs and illustrates the value of providing them in the early stages of life.**

By R. J. McGinnis

# GOLD FEVER

WHEN GEORGE PRUETT sold his dairy farm to the Kansas City subdividers and moved West to build a home on the Rogue River in southern Oregon, it was a simple gesture of retirement. He looked forward to a life of peace and ease far from cows, manure spreaders and hay balers, here among magnificent forests with their backdrop of snowcapped peaks. He would fish a little; there would be no early milking or late choring; he would have no pressures, no worries about mastitis or silo filling; and there would be no clocks.

But George's dream was shattered. He had been in Oregon no more than a week when he took down with a galloping attack of gold fever. He knew vaguely about gold fever from the tales of the forty-niners and the Klondike. Had he given it a thought, he would have said it is a conquered disease like scrofula and the Black Plague.

He soon discovered, however, that this area of the Northwest is heavily infested with the bug. Here no one is immune. One day the victim feels normal, satisfied with his surroundings; suddenly he finds himself with an aching back, blistered hands, and a fanatical interest in little specks of "color" in the bottom of a gold pan. There are no preliminary stages, no incubation period. The pains of discomfort and fatigue are anesthetized by visions of pockets of great nuggets hidden in the mountains and in the shifting sandbars of the streams.

George's wife, Amelia, contracted the disease first. She went to the village grocery for a pound of hamburger, and came home with a gold pan and an incredible story about a man named Ripper.

"I met an old man at the grocery," Amelia reported, "who had two ounces of pure gold in a little bottle. He panned it on Sardine Creek, not two miles from here. His name is Ripper."

"So what?" George asked.

"So if he can find gold, so can we."

Amelia Pruett is a woman in whom strangers invariably confide on contact. She was the confidant of the milk truckdriver and a second mother to the DHIA tester, so her new grocery friend was no exception.

"Ripper is seventy years old," she reported, "and makes a living panning gold. He said it is easy, and we're going up to his place this afternoon to learn how it's done. He said we could clean out Sam Moon's trench, right across the river from here."

George felt the stirring of unknown forces in the pit of his stomach. This is the same sensation a gambler experiences when he draws to an inside straight, and is a sure sign that gold fever has established a beachhead.

That evening George and Amelia went to Ripper's shack on Sardine Creek for instructions in the delicate art of panning gold. On their way they stopped at the grocery store and purchased another pan. They were shown an assortment of sizes, small for women and children, medium for dilettantes, large for the professional miner. Amelia insisted on the large workmanlike model for George. A gold pan looks not unlike an oversized piepan, deeper and with a wide lip. They are made of common sheet iron and the large size sells for about $2.00.

Ripper was waiting for them. To George's consternation he threw both gold pans into the fire of his potbellied stove. When the pans glowed red Ripper said, "Now they are safe for panning. One trace of oil in your pan and the flakes of gold will rise to the top and float off with the wash."

He threw a shovelful of gravel from his digging into a pan, scooped it full of water, and agitated it briskly with a rotating motion. This settled the gold to the bottom, he said, and brought the larger pebbles to the top. These he skillfully raked off with the back of his brown, calloused hand.

The contents of the pan were reduced, slowly and carefully, to a mere spoonful of fine sand. Ripper pointed out that the sand was black, which is a good sign, for placer gold is often found in black sand. Then he dipped a cupful of water into the pan and spread the sand over the bottom. There, gleaming in the black silt, were tiny flakes of pure gold. Ripper extracted these with the tip of finger and deposited them in a bottle of water. This is the approved method of storing and transporting "color."

George and Amelia soon learned the miner's squat, a posture necessary to proper panning. This position is assumed by sitting on one heel, placing the other foot slightly

(*Continued on page* 154)

**George Pruett (left) thought gold fever was as old-fashioned as hand milking until he met a real donkey-and-gold-pan character named Ripper (right) and became incurably infected.**

By Charles Straub

# Graded Cattle Draw the Buyers

**Quality feeder offerings make for successful Virginia sales.**

EASTERN FEEDER CATTLE PRODUCERS have gotten smart. They have learned how to organize sales, commingle their stock and put together offerings of extreme uniformity. Fact is, all they need to give these sales the authentic supermarket look is a bit of cellophane around the offerings.

Virginia has been a leader in this type of sale. Last fall $4 million worth of calves and $2.5 million in yearling feeders changed hands at 50 scheduled sales, 30 for calves, 20 for yearlings, held between mid-September and early November at various locations from Jonesville, 'way down in the southwest tip of the state, up to Winchester in the north, and Richmond and Petersburg in the east. This spring almost another million dollars worth of yearlings were sold at six sales. The bulk of the yearlings are steers.

In number of head this was 34,500 calves and 15,900 yearlings at the fall sales; 6,100 at the spring sales; a total of 56,500. Since over 2,000 producers consign to these sales, the average from any one herd is only around 28 head. Actually, since some of the consignments are double and triple this size, the great bulk of the offerings come in lots of 15 to 20. Yet as a result of the careful work of the sales committees and the state graders, every lot is as uniform as if all the individuals had been sired by the same bull. So uniform are they that cattle from these sales have won the carlot competition at the Ohio State Fair five out of the last nine years.

The original idea for these events cropped up almost 25 years ago. Virginia farmers had traditionally tailored their cattle production around big steers fed out almost entirely on grass for the export trade. Even as late as the latter 1930's, yearling and two-year-old steers were brought in from Oklahoma and Texas and given a year or two on the lush pastures of the mountains and the Shenandoah Valley. Some of these big dudes would weigh 1600 pounds when they went to market.

But this trade was dying before World War II and the war finished it off completely. Cow herds took over the pastures vacated by the steers. They were small herds and farmers needed some kind of a program to help them merchandise the production. Paul Swaffer, now secretary of the American Hereford Association, was at that time an extension beef cattle specialist working out of Virginia Polytechnic Institute. One of Swaffer's jobs was to try to get Virginia farmers and breeders a better price for the better cattle they were developing. C. T. McClaugherty, who was then head of the livestock grading section of the Virginia Department of Agriculture, was another who turned his attention to the problem. Largely from their thinking came the idea of organized, graded

**"They weigh 480, they're guaranteed open, they're graded Good! What do you bid for these heifers?" asks K. C. Williamson (left in auction box), as auctioneer Hugh Ownby (at microphone) cries the sale. The buyers (opposite) know the G on the back certifies a Good grade in the opinion of an experienced state grader. The calves may be from a number of owners.**

sales of feeder cattle. The first of these cooperative sales was held at Tazewell in 1938. This was a consignment sale of better grade calves and yearlings with no commingling of ownership. Commingling was not attempted until 1940.

Commingling may need a brief explanation. This is simply the practice of carefully grading and putting together lots of the same breed, sex, grade and approximate weight. In this way sizable lots can be offered, to attract the larger buyers and speed up the sale. The cattle are identified by hip and ear tags and each owner is reimbursed for his consignment on the basis of their weight and price.

It was about 1945 that the sales really got rolling. That year 5,000 calves were offered, and the number has grown steadily ever since. This growth has been essential since volume attracts the buyers and keeps the expenses per head at a minimum.

This pooling of selected offerings has been a big help for the small producers. A man can produce the finest feeder cattle in the world, but if he has no way of offering them to an interested group of buyers he is out of luck. This has been one of the problems of the producer with, say, 10 to 15 good cows. It has also been a problem for the buyer. He needs a load, maybe two or three loads, of a particular breed, color, weight, grade and sex. He can't get them from a herd of only 50 or even 100 cows. To try to pick them up in odd lots around various stockyards and auction rings is expensive and time-consuming. This is why feeder buyers have traditionally headed West in the fall to find what they wanted in one package.

A number of southern and eastern states, as well as Virginia, now have well-managed feeder sales and the buying patterns of feedlot operators in the eastern Corn Belt are changing.

The organization of Virginia's smoothly functioning sales series is, oddly enough, rather loosely knit. In 1952 there was established a State Feeder Cattle Sales Committee composed of seven members each representing a different production district of the state. This committee sets up standard operating requirements for all of the sales. It also has a contract with the Virginia Beef Cattlemen's Association under which that organization assumes the responsibility for promotion and advertising.

Individual sales committees, made up of anywhere from 3 to 12 members and an experienced sales manager, run the individual sales which are held at established auction markets. These markets furnish the facilities and personnel needed in yards and ring, and make all collections and payments.

County agents throughout the state handle educational and co-

(*Continued on page* 106)

By K. A. Harkness

# More Corn to Store

A COUPLE OF YEARS AGO I watched a public demonstration of a new corn combine operating in a field with a potential 75-bushel yield. Kernel moisture content was around 27 percent—a good level. During the afternoon, about a hundred farmers observed this demonstration from tractor-drawn wagons. The combine traveled too fast to keep up with on foot.

Many of the viewers marveled at the speed of the machine. Yet, throughout the afternoon, no one examined the ground for harvesting losses. Neither did harvesting losses become a topic of conversation. But in order to run the machine at an impressive speed the operator was sacrificing a significant part of the potential yield of the crop. Following the demonstration we checked the harvested area. Average gathering losses amounted to 13 bushels per acre, and shelling losses reduced the combine yield another five bushels per acre.

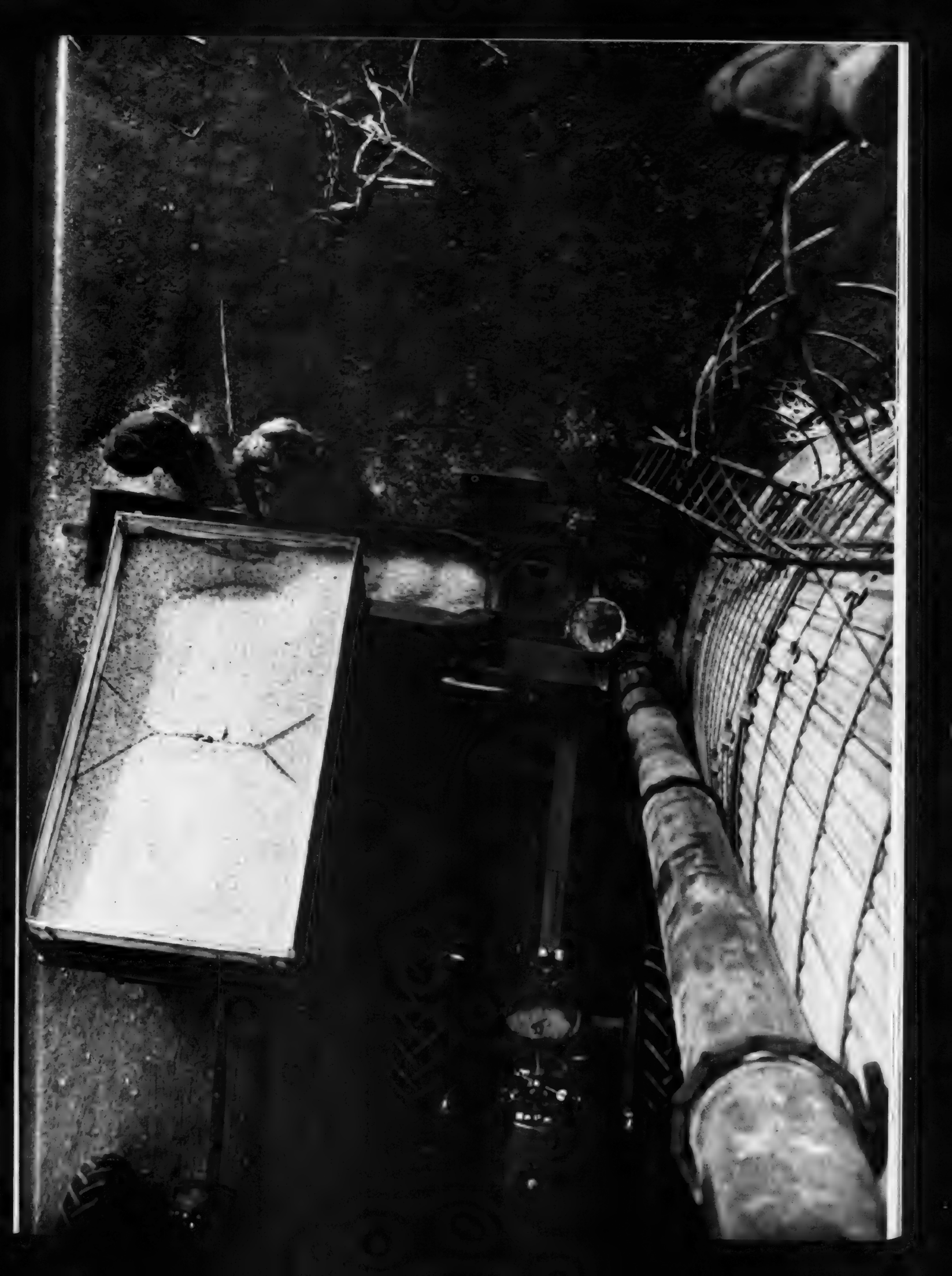
We reduced the stripper plate and snapping roll clearance and operated the machine about one-half the forward speed at which it had been demonstrated. Total harvesting losses went down to around five bushels per acre. Cylinder adjustments would have resulted in further reduction in machine losses.

This demonstration illustrated that a good stand of corn does not necessarily mean an efficient harvest. Harvested yield depends on the type of machine used, adjustment of this machine, the way in which it is operated, and proper timing of harvest. With all these factors at their best, you can harvest up to 98 percent of the standing crop. By just overlooking a few details you may haul less than 85 percent of your crop from the field.

Adjustments on a corn-harvesting machine should be made on the basis of the functions of the different parts. Essentially, these are designed to gain control of the plant, remove the ear and discard the stalk. Direct loss occurs when stalks are not gathered, when ears are not snapped, or when shelling occurs during the snapping operation. If your machine is equipped to shell the ear, additional losses may occur from unshelled kernels remaining on the cobs, and loose kernels passing from the machine with the cobs.

(*Continued on page* 158)

**You can haul up to 98 percent of the corn crop from the field (opposite page) if the harvesting machine is properly adjusted. Turning a bolt (below) opens or closes the snapping rolls a notch. The usual separation measured from the peaks of the spiral ridges is from one-fourth to one-half inch. A lever (below) raises or lowers the husking bed feed apron for maximum husking and minimum premature shelling.**



By Max B. Heppner

# The Nitrogen Calendar

YOU CAN TURN the variety of forms in which you buy nitrogen into an asset by matching a product with the season when it is most convenient to spread. The result—a nitrogen calendar—helps minimize the interference of applying fertilizer with other chores, and helps maximize returns through efficient application of nitrogen.

Usually we think of a fertilizer solely in terms of its capacity to feed plants. This calendar is concerned almost exclusively with ease and cost of application. For example, urea is chiefly for fall when it can be sprinkled over the trash it will help decompose; liquids are a good bet for winter when the frozen ground will support the weight of the tank trucks; and anhydrous ammonia is mainly for spring when it can be knifed into the soil without the interference of trash.

Ideas such as these find their source in northwestern Indiana with farmers who use a lot of nitrogen on their principal crop, corn. The days warm and dry enough for plowing cornland are limited in this

area. Therefore, ways to apply nitrogen that do not interfere with the tight plowing schedule are a godsend to these farmers. Their land is fairly level, mostly heavy clay soil—the eastern edge of the prairies. Corngrowers farming on similar heavy clays in a climate with similar winters—cold enough to restrict time available for plowing and planting, while keeping nitrogen loss to a minimum—may similarly benefit from the nitrogen calendar.

A visit with some of these northwest Indiana farmers shows how they manage their nitrogen applications.

### Urea for Fall

Art Brost of Ambia, Indiana (about 35 miles west of Lafayette), raises 215 acres of corn and uses his equipment to custom-spread pelleted urea (45 percent nitrogen) on about a thousand acres besides his own. He explained how fall plowing and fertilizing with urea fit together.

"It was fairly warm last December for that late in the season," he said. "I got out the truck and spread urea on as much land as I figured I'd get plowed. I spread between 100 and 125 pounds on the pasture and 200 to 225 pounds on the wheat stubble. I got 75 acres of wheat stubble and clover pasture plowed.

"Most years I also fall-plow some cornland that's to go to corn another year," Brost added. "I truck on 225 pounds per acre. Then at planting time all the cornland gets 150 to 175 pounds of 7-28-14 or 6-24-24, depending on the soil test. Last year this gave me a 117-bushel yield."

Brost said he'd advise fall applied urea even for a farmer who doesn't have an applicator sitting in his barn and has to depend on others for fertilization.

"My truck, loaded, weighs 8½ tons," he explained. "When it's just getting dry enough to plow in spring, it's still too wet to drive the fertilizer truck on the fields. In spring everybody wants me to be at his place at the same time, and somehow I never seem to be able to do it. In the fall and winter, a farmer can just about pick the exact hour he wants the truck to come.

"Another advantage of urea is that we can mix it fairly well with potash for fields that need it. We charge no more per acre for the application than we would for putting on potash alone.

"Even if a customer doesn't get to plowing soon after we put on urea, it will still be there when the field is ready," Brost added. "Urea dissolves easily. The nitrogen ties right to the soil particles inside three days. That holds for clay and gumbo soil and land like it. In light soils with little clay there'd be some real loss. But on our land, getting urea on the land early is a gain. Have Ralph Snelling explain that. He was with the USDA 17 years as a plant breeder and is well up on fertilizer information."

### Stretching the Benefits

Snelling lit up his pipe, relaxed, and continued where Brost left off. "The nitrogen in urea makes ordinary trash in the field, like corn stalks, do the same job as clover," he said. "You know, clover has nitrogen in the roots put there by bacteria. Stalks in an old cornfield also have potential nitrogen in them, but it takes bacteria and other soil organisms to make it available. Under an acre of fertile soil there are 4,000 pounds of living organisms—the equivalent of 20 two-hundred-pound hogs. But, like hogs that need protein, soil organisms aren't effective unless started off with nitrogen. In a cornfield that has had around 200 pounds of urea put on, the bacteria provide over a third of the nitrogen needed to grow the crop. That's quite a saving.

"What is more, bacteria release nitrogen at about the same rate as the corn plant needs it for growth. Their activity increases with warmth of the soil. When the corn ears are forming and the plant is crying the loudest for nitrogen, the peak of nitrogen formation is reached."

### Farmer-Applied Urea

Ralph Snelling added, "It isn't only Art Brost and the farmers who get him to bulk spread for them who like fall fertilization and use urea. For example, Charles and Audley Oshier, over at Otterbein a dozen miles northeast of Lafayette, raise about 300 acres of corn each year—and they are big fall urea customers. They don't buy in fall for the discount, either. You get discounts only on mixed goods."

The Oshiers backed up Snelling's words. "We make our money from grain," Charles Oshier said, "though my son Audley runs about 56 ewes over by his house. We like to fall-plow for one thing because we want to stay ahead of the cockleburs. Last fall we got 103 acres done before the cockleburs went to seed. The old bean and pastureland had about 150 pounds of urea put on the day before we plowed. Then when we planted corn this spring we added 165 pounds of 6-24-24 per acre through the planter. With that we seem to hold our own on potash and phosphate."

The Oshiers use their oat seeder to spread urea. The single, wide arc made by urea pellets flung behind an oat seeder possibly is the reason Charles Oshier always speaks of "scattering" fertilizer.

"Last winter, we finished picking corn about the second or third of December," he said. "I followed the picker with the disk

**The slinger, a machine designed to spread a thick liquid fertilizer, is adapted for use in winter. The tractor-drawn model, soon to be available for around $600, is shown (left) being refilled from a tank truck, which is also equipped to spread this semi-solid fertilizer.**

## The Nitrogen Calendar

Choosing among nitrogen forms, which basically are equally effective, becomes a matter of picking the one easiest and cheapest to apply. Northwestern Indiana corngrowers' preferences form what might be termed a nitrogen calendar to suit their climate (cold winters and wet springs) and soil (mostly clay). They prefer urea for fall and winter. Their land is dry or frozen. Compaction is further minimized by using light, farm-owned machines. Off-season labor is profitably employed. Urea can be sprinkled over trash which it will help decompose and can be mixed with potash for a single application. It is handy for application with limited fall plowing.

A new heavy, liquid fertilizer called slurry is starting to find favor for inexpensive farm or custom application, particularly in winter. It supplies as much of the entire year's fertilizer needs as desired, including trace minerals. Anhydrous ammonia is ideal for application in spring when the ground is cultivated and dry and friable. There is a reviving interest in plowing down ammonia, which is timely whenever it's possible to get on the land with a plow.

**A farm-owned or custom-operated high-speed machine is ideal for applying urea pellets in fall or winter. This machine, spreading 50-foot swaths at five miles per hour, covers more than 20 acres in an hour.**

after we got the corn in, except when the ground was frozen. We scattered the urea on a still day. Audley kept the fertilizer hopper filled and, driving right along, we scattered 60 acres a day without strain."

Some of Oshier's neighbors who are kept busy feeding cattle in winter, use a fertilizer spreader that does the job faster. The new Belt spreader with a hopper capacity of a ton of urea pellets covers a swath 50 feet wide, whereas the oatseeder is limited to a 30-foot width per pass. One man, spreading 200 pounds of urea per acre with the specialized spreader, can cover 10 acres in 30 minutes without getting off the tractor.

### Slurry from the Slinger

Neighbors of the Oshiers are trying out a new, syrupy kind of fertilizer particularly adapted to late fall and winter application. It contains all three fertilizer components and can be used to take care of a crop's entire fertilizer needs, including starter.

Though the product, called slurry, is new, the manufacturers, Edw. J. Funk and Sons, are an old, established firm with headquarters at Kentland, Indiana, the seat of Newton County. Bill, the third-born of the seven brothers, heads the fertilizer department. He is a cordial man, absorbed in his work. Last summer he exhibited a bottle of his fertilizer amid the experimental equipment in the laboratory adjoining his office. The slurry looked like syrup, felt like glue, and actually was muddy water. But the special, extra-fine clay in the slurry, unlike that in backyard mud, does not settle out. Each small particle not only holds up itself in the water, but also carries fertilizer. Therefore, slurry suspensions hold up to a third more fertilizer than conventional liquid fertilizers. Analyses such as 18-8-12 or 14-14-14 are possible, instead of the common 8-16-8 or 9-9-9 combinations.

Making slurry is not new. Spreading it is. Funk engineers solved the problem of clogged nozzles by inventing a "slinger." This applicator delivers fertilizer through what the Funks call "spinners." These are much like sprinklers on an irrigation riser, mounted upside down. They literally sling the fertilizer slurry out as they twirl.

"We can make up slurry in the exact proportion of nitrogen, phosphate, and potash a field needs to produce a certain corn yield," Bill Funk said. "By the way, slurry contains trace minerals, too, which is not true of conventional liquids. But to return to the major elements, a hundred-bushel corn crop depletes the soil of 96 pounds of nitrogen per acre, 41 pounds of phosphate, and 28 pounds of potash. We can make up a 19-8-12 analysis that supplies the nitrogen and phosphate almost exactly and builds up the potash, spread at the rate of 500 pounds per acre. This way we believe there is no need for further fertilizer application at planting time.

"Fertilizer slurry is ideal for winter application," Bill Funk continued. "Very little is lost. We have a formula with all the nitrogen in ammonia form, which is safe even for fall application.

"We have also adapted the slinger to sidedress slurry right in rows of standing corn, to extend our spring season. We mounted knives instead of the spinners and operate much the same way anhydrous ammonia is sidedressed nowadays.

"The best thing about using our slinger," Bill Funk added, "is that it saves money. We can pass on a 10 percent savings since we don't have to dry and pellet our fertilizer. Besides, there is no bag charge. Customers who formerly bought bagged goods save another $4 per ton. The biggest saving is in the application charge. We charge 75 cents per acre. To top it off, the slurry customer can save the cost of applying starter fertilizer when he plants his corn."

Funks sold slinger-applied fertilizer for 10,000 acres last winter. So far they are limited to a 50-mile radius from Kentland, since they alone own the machines. Plans are underway to supply truck-mounted slingers with 1,000-gallon carrying capacity to other custom applicators. Funks also have built tractor-drawn models with pumps driven from the pto. They hold 500 gallons, and Bill Funk believes they could be sold for less than $600. Both models are designed to cover a swath of 44 feet.

### Anhydrous for Spring

Anhydrous ammonia (82 percent active) is the nitrogen form that comes into its own in spring. Bob Sondgeroth, Ambia, Indiana, applies anhydrous ammonia on a custom basis on 4,000 to 5,000 acres per year. He explained the limitations of his service this way:

"I'd sure like to extend the season, but as of now, spring is the only time of year I sell. Experiments show that ammonia sticks to the soil perfectly over winter, but farmers just don't have their cornfields ready for the applicator in fall. There is very little fall plowing around here—and even fall-plowed land that isn't disked or harrowed is too rough for successful application of anhydrous ammonia."

In spring, however, Sondgeroth really has to move along, as anhydrous ammonia in

**Anhydrous ammonia is a popular form of nitrogen in northwestern Indiana for application in spring. The tilled ground is dry and crumbly enough for application at an even level and for proper covering over.**

his area is usually the cheapest nitrogen source. He has a two-wheel trailer into which he clamps the front wheels of his tractor. He pulls the small trailer, the tractor and the applicator to the job behind the truck holding a day-long nitrogen supply. With this rig, Sondgeroth can cover 75 acres without restocking ammonia.

There is a possibility that someday ammonia application won't have to be a yearly job. A project of Farm-Orama, a farm show held the past two years at Richwood, Ohio, consisted of applying enough nitrogen for several crops all at once. Project leader Dr. George N. Hoffer, fertilizer specialist from Lafayette, Indiana, applied anhydrous ammonia at levels ranging from 275 pounds to 1310 pounds in May 1959. The plot that received 275 pounds yielded 111 bushels per acre in 1959, and 126 bushels in 1960. Both years, plots with higher nitrogen applications yielded 2 to 7 bushels less—due to plant food imbalance, Dr. Hoffer suspects. Yet men working with the project believe that they may be able to work out a one-time application of a three or four year's supply of nitrogen for a continuous corn program, without seriously depressing yields. They feel that so far results indicate "storage losses" in the soil may prove small enough to be more than offset by savings in application costs and quantity discounts.

### Ammonia Plowdown

Several Indiana farmers have tried applying anhydrous ammonia while plowing, both in the fall and in spring. Ammonia from a tank mounted on the plow or the tractor passes through a three-foot hose dragged six to nine inches underground behind each plow bottom.

"A number of farmers I know have found anhydrous plowdown very practical," commented C. L. Hill, Purdue University agricultural engineer. "A weather pattern of the kind we have this year and last—lots of rain when we're trying to get the corn ground ready—has prompted many farmers to give plowdown a try."

The Rothenberger brothers, Erland and Bill, of Frankfort, Indiana, plowed down ammonia on 360 corn acres this spring. "It worked just elegant," commented Bill afterwards. "Using a five-bottom plow, we plow-planted 35 acres in a long day. This included putting down ammonia. It was a real advantage this year, because with all the rain, early-plowed land would have been too caked-over for putting down ammonia with a conventional applicator. We sold our applicator and got together a plowdown rig at just about the price we got out of the old applicator—$450."

The Rothenbergers welded the brackets to hold the tanks and fertilizer hoses on their equipment themselves. They bought two ammonia tanks, one for each side of the tractor. They installed a John Blue metering device (Nitrolator) on a tractor fender, so they could keep ammonia flowing at the rate they prefer—120 to 140 pounds of actual nitrogen per acre.

Applicator hoses trail behind each plow bottom. The Rothenbergers bolted L-shaped brackets to the plow frame, to which they attached a pipe nipple and a clamp to hold a 36-inch piece of replaceable hose. After covering 150 acres, the trailing hoses wore out and had to be replaced. (Cost, 25 cents per foot.) The brackets are also handy for holding the hoses away from the furrow wall to keep ammonia from seeping out along the edge of the furrow slice.

Bill Rothenberger said that his two 110-gallon tanks covered six acres. Refilling took 20 minutes, using one "nurse" tank. By driving the tractor between two refill tanks, the brothers discovered they could do the job in almost half the time.

The extra weight on the tractor was no problem. Fully loaded, the tanks added 1200 pounds, two-thirds of which rested on the front end. Since the manufacturer of their mounted plow recommended 800 extra pounds on the front end of the tractor, they cut the weights added to 250 pounds.

Purdue's extension engineer Hill said that a farmer mounting ammonia tanks on the tractor and trailing his plow, needs a safety chain from the drawbar to the plow hitch. Without it, the ammonia hose would snap if his plow ever disconnected.

Hill said that a single tank is best mounted on the left side of the tractor. He warned that only the heaviest duty plows can support the heavy load of a plow-mounted ammonium tank. The additional weight tends to shake bolts loose and, without daily tightening, the plow would fall apart.

Put these Indiana fertilizer ideas together, and the nitrogen calendar shapes up like this: Urea, and possibly some liquids, are particularly convenient for fall application. Anhydrous application fits into the work schedule as a spring job, giving excellent results after the soil has become fairly dry and crumbly.

Then there's the possibility of putting several years' supply of nitrogen down, if you have the ready cash to plunk down for a four-year supply of nitrogen.

# Summer Crops,

By Chester Charles

# Winter Livestock

THE JONES-MORGAN FARM at Prairie Creek, Indiana, has no white fences, no pushbuttons and, to a summer visitor, no visible claim to big livestock production. Yet this southwestern Indiana farm has quietly developed into an unusual partnership venture producing 1,200 fat steers and 1,800 hogs annually. Here is a farm with a carefully drawn blueprint for success involving superior management, employee benefits, seasonal shifting of labor from enterprise to enterprise and year-round efficiency.

About 144 gilts farrowed last winter. The cattle feedlots were crowded. Now, one man can handle the few cattle and hogs remaining. The rest of the help will be needed to harvest the corn rapidly approaching maturity.

Heavy rains delayed fieldwork this spring. Corn planting was three to four weeks late. Laid-off factory workers were hired as a night shift. Working around the clock, 520 acres of ground were plowed, fitted and planted in 14 days. There will be no lull in the fieldwork until after the big trench silo is filled. By then the new cattle will start to arrive and the cycle will begin again.

Willard Jones, the senior partner, is an organizer. He operated the original setup in the early forties and added acreage when he could. No hogs were raised then; about 300 steers were fattened on pasture an-

**With no cattle around from the end of May till early fall, manpower on the Jones-Morgan place switches to the tractors (opposite page) and concentrates on fieldwork. When winter comes (right) cattle convert the harvest to meat.**

### Summer Crops, Winter Livestock

Here is an Indiana farm with a carefully drawn blueprint for success, involving superior management, employee benefits, seasonal shifting of labor from enterprise to enterprise and year-round efficiency. The operation is on an unusual partnership basis and gains its strength and efficiency by emphasis on cattle feeding and pig raising in the winter, with the labor force transferring to fieldwork, and with little or no livestock in the summer. In addition, the partners have originated a number of extremely economical and efficient feed storage and handling devices.

nually at that time. Now in his seventies, Jones has fed cattle most of his life. Co-ops have always been another of his interests. As president of the Indianapolis Producers Marketing Association, he took the lead in encouraging meat type hog production.

Ralph Morgan, 37, attended Purdue as an engineering student. He rented a farm for a time, then spent two years overseeing a land-clearing and drainage job, along with a large cattle operation in Florida. There he designed and built a 21-foot rotary mower, among other unavailable but needed tools. His managerial and mechanical abilities came to the notice of Jones, whom he joined seven years ago.

The partners farm 777 acres, over 550 of which are in continuous corn. Their cropland, on all four corners of a crossroad, is perfectly level. Last year their overall average was 109 bushels of corn per acre. Wise use of fertilizer along with well-timed operations have consistently improved their yields. Willard Jones early in his career recognized the value of timing. Their type of soil must be plowed and worked at just the right time. Silage, on which Jones relied as his major cattle feed, had to be made at just the right time, with sufficient help to do the job quickly and insure quality.

In 1954 Jones teamed up with his young neighbor, Ralph Morgan. Their farming innovations have been notable. Together the partners decided on two essentials—reliable help and plenty of it. They found a way. Employee benefits opened the way to employee good will and dependability. A new livestock program confined primarily to the winter months released help for fieldwork when spring and summer demands were greatest. One problem remained. The partners needed a practical agreement which defined the responsibility of each. They worked that out, too.

### A Share in the Profits

Theirs is a well-organized partnership, with each partner sharing according to his contribution. Willard Jones owns most of the land; Ralph Morgan owns 180 acres. Each puts up a share of the operating cash. The partnership owns all of the equipment. Jones is paid a small salary for the occasional hours he is able to be on the job. Morgan is paid a salary commensurate with the long hours of a working manager. Each is then compensated on a percentage basis for the capital individually invested in land, buildings, machinery, etc. Profits beyond that are divided equally.

The permanent labor force consists of four full-time men. Each receives a salary, a house, one hog and a quarter of beef per year, plus $100 as a bonus (if he has stayed a full year) and a small payment for every animal marketed. These incentives have paid off.

Paul McPheeters has been an employee on the place for 21 years. His son, Kenneth, now 23 and married, never worked elsewhere. Paul lives in one of the employee houses, and Kenneth has a house trailer nearby. Together they are responsible for grinding and processing all feeds used in the winter. They haul and spread all the bedding.

Charley Greenwell has worked on the farm six years and seven years previously for Morgan, a total of 13 years. His house is near the farrowing buildings. While hogs are on hand they are his responsibility. He fills the self-feeders and tends any sick animals and keeps the bedding fresh. He does no tractor work, winter or summer. In summer the care and feeding of any remaining steers and the finishing hogs become his main job.

Hubert Case, a six-year employee, also lives in one of the employee houses. He feeds the pregnant gilts, and the cattle in winter. Both are fed once a day, in the morning. The job takes until noon. Afternoons he does odd jobs.

Bill Lowe, on the job for 20 years, retired in 1959. Now on Social Security, he helps out when needed, mostly in summer crops, to the extent of the allowable maximum of $1200 a year. His son also works part time, mostly during summer cropping and August silo filling.

By plowing time, all the gilts have farrowed. Charley Greenwell continues to handle the growing shoats and takes over the few cattle in the feedlots. The others, Paul, Kenneth and Hubert, with the Lowes if needed, switch to fieldwork. With all four on four tractors in one field, the work moves swiftly; a field is worked up in short order. Equipment is kept in perfect order; greasing and refueling are systematic. On

This is the core of a corncrib. It consists of an "A" frame centered on a cement slab. There is no roof or sides; picket fencing holds the corn.

Ralph Morgan designs his own buildings and erects them at minimum expense. His roofless corncrib cost eight cents per bushel of capacity.

rainy days they help Charley catch up on livestock chores, and grind a reserve supply of feed. Meantime Jones keeps a watchful eye on what he can, while Morgan is all over the place doing "whatever no one else can do," helping out and troubleshooting. A rotating schedule of days off gives everyone an occasional break. If weeds get ahead of the corn crop, or if rain has kept the ensilage chopper out of the fields, everyone pitches in and saves days off for later.

### Two-Platoon System

Summer crop preparations begin as early as late January, when the first of the cattle go to market. Feeding takes fewer and fewer man-hours, leaving time for getting machinery in order. In March, Morgan takes soil samples in all the fields. By April, most years, everyone spends part-days plowing and seeding clover in three of the nine hoglots. These 10-acre rotational lots are rested from hogs one out of every three years by plowing and seeding to small grain and clover. This year the wet weather delayed oats planting and it was May 20 before corn-ground plowing started. In normal years most of the corn is planted by that date.

All but Greenwell join in readying the corn ground, which is seeded to rye over the winter. Lime is applied if needed. Enough fertilizer for a 100-bushel corn yield is used, most of it being applied as "plowdown." Sacked but unmixed phosphate and potash materials are spread. Anhydrous ammonia, knifed in before planting, supplies the nitrogen. Morgan objects to later applications because of possible root-pruning. Total fertilizer applications are about as follows:

| | Corn for grain | Silage corn |
|---|---|---|
| Nitrogen | 105 lbs. | 150 lbs. |
| Phosphate | 36 lbs. | 44 lbs. |
| Potash | 46 lbs. | 118 lbs. |

The above includes a row application of 65 pounds of 8-32-0 at planting time. Running the planter is normally Paul McPheeters' job. This year McPheeters ran the planter in the daytime. Morgan spelled him while the night crew was working. All planting is done around the field, instead of back and forth. Morgan has found this method

(*Continued on page* 136)

# DRYING UNDER THE SKY

IN A CORNCRIB, as with everything else, Ralph Morgan of Prairie Creek, Indiana, wants low cost, utility, and simplicity. When Morgan needs an unavailable piece of equipment or a special building, he designs it. The bulk of his livestock are fed during the winter months. Last fall he needed crib space for short-term winter storage. He wanted it to be cheap, to offer quick in-and-out loading and to include forced-air drying for corn picked at high moisture. The unorthodox crib he conceived is about complete in the pictures shown, although the impression given is that it is still only in the early stage of construction. The only part unfinished is a small roof over the front fan and motor.

The crib consists of a cement slab 40 feet by 120 feet, sloping from the center to each side and toward the rear as well. Along each of two sides, wood posts support 4-foot high picket fencing. Across the back are slat gates for entrance and exit of vehicles. The front consists of a triangular shaped framework of two-inch by six-inch rough lumber faced with ¾-inch exterior plywood, held up by poles set in the ground. The center of this front section opens on an "A" frame of slatted lumber such as is used in conventional corncribs for air circulation. The "A" frame is slightly shorter than the cement slab so corn can be piled at the rear to slow the airflow. This causes the air to be pushed through all the corn. The fan and motor, which were put in storage for the summer and hence do not show in the photographs, are all that were needed last year to dry and store a large part of Morgan's 1960 corn. Last fall, ear corn with moisture as high as 30 percent was stored in it without spoilage.

This structure holds 15,000 bushels. The total cost, including a $350 five-foot fan and 15-hp motor, came to $1,250, or about eight cents a bushel.

In filling, trucks are driven through the rear gates into the crib and dumped until the floor area is covered, then the corn is mounded over the "A" frame by an elevator, and the fan turned on. There is, of course, no roof. The crib is open to the birds and elements, but as Morgan says, "As long as the corn is fed before warm weather, the crib works fine."

**The complete crib looks like a barn that met a tornado. A short roof will be added to protect the fan and motor at the center of the plywood front. Last year 15,000 bushels of ear corn were stored in this crib without spoilage.**

# The Monster That Cannot Forgive

By Robert Carmody

IN THE AUTUMN after the first frost, we prod the monster awake and drive him, chattering and roaring, into the fields to work. "He's cruel," we say when we first wake him. "He will take off a finger or an arm—like that. Remember Harv? Lost two fingers so quick he didn't even know it for a couple of minutes!"

Later in the season, when his chains and points are shining from rubbing through the corn, and the dust on him is the dust of chaff and leaves, we forget that he can kill and maim. We become as casual and contemptuous of him as we would of a toothless lion or a chained bear. All we want out of him is work and we drive him as hard and as fast and as long as we, ourselves, can endure.

And one hurried, distracted day, one day during the tired, hungry period before lunch or that last, sweat-grimed hour in the evening before hog-feeding and a shower, the monster grabs and tears and rends. He is entirely ruthless. For a mistake so slight and so explainable that any judge, no matter how cruel, would readily forgive, the monster condemns his farmer to death or to a lopping off of hands or arms or fingers. This is the brute we wheel out each fall.

After the tourniquet, the rush to the hospital, the skillful trimming of torn flesh and bone to form a stump, the stitching and bandaging, after all this we and our neighbors revert to our first thought—that the monster is cruel, brutal, vicious. But the cruel can sometimes be kind, the brutal can be gentle and the malevolent can make allowances—the corn-picker monster must always be implacably ruthless. This monster is a machine and can do only as machines do. He has no soul, no malice, no anger, no rancor, no hate, no forgiveness, *no forgiveness,* NO FORGIVENESS. He can forgive nothing, no matter how slight the mistake, no matter how pressing the circumstances. He cannot forgive—he can only move, and grab, and crush, and cut. Every man he cripples can think of an excuse—a reason why it should not have happened to him.

When Dale Harvey had sickness in the family and was desperately worried about the trip he must make to the hospital, and was rushed to get the cornpicking done, anyone but the monster would have made allowances, overlooked a slight error. The monster took three fingers—fast and clean. "I knew they were gone before I saw. I believe I must have heard the chain and sprocket rasp them off but I couldn't feel a thing. I was afraid to look."

Bill Gale should certainly have been forgiven one small oversight. He was tired; he had already put in a full day on his own when he went to pick his father's corn. Besides, he had specifically asked that they buy a guard to replace the one that had fallen off. He had even promised to pay for it himself. But he forgot to check to see if it had been done. On a turn, when he made a swinging reach to disengage the pto, the drive gears cut through his hand so clean hardly a drop of blood came through the pinched-off wound. "I couldn't believe it. I have always been so careful of machinery. And it's more, I find, than just losing a part of you. I guess I was always too proud of the strength of my hands. Today, a year later, I still feel somehow humiliated—not quite a whole man."

Loren Welton was not entirely blameless, but he took every precaution. He knew he shouldn't get off the tractor seat with the machine running, but he felt he couldn't break the jam in the husking bed if he shut it off. He took a chance with his own life.

He was as careful as a butcher using a high-speed meat grinder. He couldn't have known that his son Dick had wandered out to the field. And even then nothing would have happened if the boy hadn't tripped and flung out an arm to break the fall . . .

A machine will forgive nothing. It does not care what the reasons, what the compelling circumstances, how pressing the situation that made us forget the rules just this once. It is, and always will be, unforgiving. It goes by the rules. And that is the answer. The machine never cheats—if you live by the rules you are safe. And the rules? They are the best practices we know with our present machines.

Work by these rules and we will pick more corn and live to farm another year.

**Rules**

• Keep the machine in good repair—if it's running right you're less likely to be tempted to get your hands in it.

• Stop tractor engine and pto before getting off.

• Some safety jobs—like machine maintenance—must be done ahead of the picking season. Mechanically or chemically keep the weeds out of the corn during the growing season for more corn and safer picking. If you *have* weeds use weed shields on the gathering-chain sprockets and vine knives to prevent wrapping of the snapping rolls.

• Don't give the monster a thing to grab—wear snug-fitting clothes and don't try to save a penny with two thumbed gloves if you want to keep the two thumbs you've got.

• Wear rubber-soled shoes in wet weather to prevent slipping.

• Be sure there is a fire extinguisher on the tractor.

• Don't start the machine until everyone is out of the way.

• No extra riders—the monster is no hobby horse.

• Keep the picker on the row—stalks coming into the gathering points at an angle tend to clog.

• Stop tractor engine and pto before getting off.

• Keep your hands and feet away from the snapping rolls, chains, husking rolls and other moving parts when the machine is in motion.

• Stop tractor engine and pto before getting off.

• Never underestimate the speed of the machine—the outer perimeter of the rolls is moving twice as fast as your fastest reaction time. You may think you can pull a stalk out fast, but before you can let go of a stick or stalk grabbed by the rolls you will be pulled in.

• Stop tractor engine and pto before getting off.

• Never oil, clean, adjust, or pull the chain or belt guards while the machine is running.

• Stop tractor engine and pto before getting off.

• If you take the guards off, always replace them before starting. Never run a pto without all pto shields in place.

• Loosen the slip clutch springs at the beginning of the season—then tighten them just enough to prevent excessive slipping.

• Check for possible loose parts and be sure all tools are removed after servicing or adjusting.

• When working under the snapping units, block them up—the hydraulic lift could give out on you.

• Don't work yourself to a frazzle—most accidents can be traced to fatigue.

• Don't disconnect the wagon on a slope without blocking the wheels.

• Stop tractor engine and pto before getting off.

By Grant Cannon

IN THE CONGO, where the balance between democracy, Communism, and utter choas is most precarious, 300,000 Baluba tribesmen were driven from their homes and into South Kaisi, whose normal population is a million. The bloodshed and turmoil this great mass of starving humanity could have caused was all too apparent. The Communists would have asked for nothing better. President Kennedy ordered food shipped. Within two weeks, stores of dried milk from California, Wisconsin, and Minnesota; wheat from Kansas and Oklahoma; corn and beans from Nebraska, Iowa, Illinois, and Indiana had been assembled, shipped and were being fed to the people. During the next few years we will continue to send our surplus food and fiber to the Congo and to over 90 other nations, to feed hungry people and to support the growth of freedom. So important is this program in the minds of its administrators, they say if we did not have a surplus we should grow one for this purpose.

One of President Kennedy's first appointments—even before he selected his Secretary of Agriculture—was that of George McGovern to direct his newly created Food for Peace agency.

"As long as there is acute hunger in the world, and as long as we have the capacity to make a contribution in reducing human hunger, we ought to meet that opportunity and responsibility," McGovern said recently. "I think food too important a resource from the point of view of our foreign policy objectives and our moral responsibilities, for us to restrict production to the point where we are incapable of providing some food assistance abroad."

There seems little likelihood that McGovern will be called upon to defend his position, since surpluses will be with us for many years, but his statements do show his attitude toward the program. Emphasis, he feels, should be on the constructive use of our food abundance, rather than upon surplus disposal. It is his plan to push vigorously the use of our agricultural wealth to strengthen the free nations of the world. As he said, "I am convinced that if Khrushchev had our agricultural abundance, he would be using it with great vigor and imagination to try to promote his cause in those nations which are struggling for greater economic development. We have the food and we should use it."

When he makes this statement, this quiet, thoughtful, rather handsome man, who was formerly a professor of American history and political science, and also a member of the House of Representatives Agricultural Committee from South Dakota, is speaking for the President. He also, curiously enough, is voicing the sentiments of most members of both political parties, since the law he administers was passed in 1954 under a Republican regime by a Democratic Congress, at the urging of the Republican Secretary of Agriculture.

The question has not been: "Should we use our rich agricultural surplus to strengthen the free world?" but rather: "How can we use the surplus in this way without ruining the farmers of such friendly nations as Canada, Australia, Argentina and France, who are also exporters? And how can we use this surplus without wrecking the farm market in the countries we are trying to assist, and so bringing disastrous prices to their farmers?" Public Law 480 is our legislative answer by which we hope to solve this difficult problem.

The law is not, as many think, a pure give-away program. By far the greatest amount of materials shipped on P.L. 480 authority has been paid for either in the currency of the importing country or by barter of strategic goods which the United States is stockpiling. A much smaller amount has been outright gifts, either from our government, or through some 57 voluntary agencies which serve humanity overseas.

In terms of actual dollars we have shipped abroad a total of 28,500,000,000 dollars worth of agricultural products since 1954. Of this amount, 19 billion dollars worth was our normal exports paid for in dollars. Four and a half billion dollars worth was sold for foreign currency (often referred to as soft currency). One billion dollars worth was given to the needy by our voluntary agencies and another 600 million was given on a government-to-government basis. Barter deals amounted to around a billion three hundred million dollars worth of goods during this same seven-year period.

Another way of looking at these figures, and one which McGovern is happy to explain, is that each year we have shipped around 12 million tons of surplus goods which would have cost us some 75 million dollars to store the first year, and 45 million every year thereafter. Though McGovern does not emphasize the surplus disposal aspect of this program, incidentally, he has increased shipments during his brief period by around 10 percent.

### Hard Sell for Soft Money

The sales for foreign currency are far from simple. They are, as a matter of fact, about as complex as the formula for a new insecticide.

In making the sale, we agree to accept the currency of the buying country without converting it into dollars. The way such a nation earns dollars is to export goods to the United States and other hard-currency markets. Since most of the emerging countries have not yet developed dollar earning power, dollars are in short supply—hence the agreement not to convert their currency and reduce their dollar credits. This enables them to continue spending their dollar credits for their normal importation of American agricultural and other products. We also agree just how the money paid for our goods will be spent in the buying country.

In making such a sale, our negotiators must be assured that the sale will not displace any normal commercial agricultural sales being made by us or by other friendly exporting nations. They must also determine that the sale will not disrupt the economy of the receiving nation by breaking local farm prices. In addition, the negotiators must secure an agreement against the re-export of the commodity, and also that the added food will not increase the availability of a similar product to the Soviet bloc. They must also decide the rate of exchange which will be used to determine dollar value of the commodity.

Perhaps the giant Indian agreement, which involves $1,300,000,000 worth of wheat and rice to be purchased over a four-year period, illustrates how such sales are put into actual effect.

With the basic agreement negotiated, the Indian Government put their American Purchasing Mission to work. This Mission is housed on Massachusetts Avenue, Washington's embassy row, in a stately white building guarded by two carved elephants, and is staffed with Indian nationals. The actual buying is done by men like L. M. Joshi, the Deputy Director, who combines the quiet, placid approach of a Hindu mystic with a sharp, agile mind that would do well in the Chicago grain pits.

"We continue to purchase with dollars the four hundred thousand tons of wheat which, historically, we have always bought from the United States," Joshi said, in explaining the purchases his mission makes. "Over the four-year period which the agreement covers, we hope to buy under P.L. 480 a total of some 16 million tons of wheat, a million tons of rice, and a small amount of cotton, corn, sorghum, and tobacco. In buying and shipping such wheat, one of our major problems is to schedule the shipment so that our port facilities and distribution system can handle it. We must also take care our purchases don't arrive at the same time our own crop is being harvested, and overload the mills.

"The mechanics of buying are these," he continued in his soft voice with its rather British accent. "Our government notifies the United States that deposits of rupees have been made in an Indian bank to the credit of the United States. All of our purchases go through regular commercial channels. We wire the American exporters type and quality of grain we wish to buy, and the port from which we wish the grain shipped. The exporters make bids. We analyze these bids on the basis of our knowledge of crop outlook, export demand, futures market, the farm policies of your government, and other such matters as affect price. The bids, of course, are all made on the basis of the international wheat price, which is not the same as your domestic price. Usually it runs 66 to 75 percent of the domestic price. We will bargain for as little as a quarter of a cent. Every penny we save can send an ounce of food to India."

L. M. Joshi paused to emphasize his remark. His fine-boned face which combines both youth and maturity looked thoughtful, then he continued, "Once we have established a price, we buy as much grain from the lowest bidder as he can handle, and then offer to buy from other bidders at this same price. The seller agrees to have wheat ready at the port between certain dates. We guarantee to give ten days' notice of the availability of a boat. Part of our agreement with the government of the United States is that at least 50 percent of the grain will be shipped in American ships and paid for out of 480 funds. The Indian Government pays the other half of all shipping costs."

Since unconvertible rupees deposited in a Bombay bank have little appeal for American grain exporters, still further steps must be taken before the sale can be considered complete. When the Indian government deposits funds to the account of the U. S. government in Indian banks, the CCC makes dollars available to pay the American exporter. In addition to this cash export price, the seller takes the bill of lading to the CCC and receives the export subsidy, which amounts to the difference between the international price and the domestic price at which he must make his purchase. This subsidy, which runs about a quarter of the world price, is paid in wheat from CCC stores, with the proviso that this wheat *must* be exported. The way this works is that when an exporter wishes to ship wheat, say 10,000 bushels, he buys the grain on the regular, commercial market and ships it. He then receives some 2,500 to 3,300 bushels from CCC, the exact amount depending on the export subsidy at the moment. This wheat he may use to fill his next foreign order—it cannot be sold back onto the American market.

When the grain arrives in India, it is put through commercial channels by the Indian government. "This does not affect the marketing of our own wheat, which is raised in the northern part of the country," Joshi said. "We have a price support program on our wheat, and the grain which we import under Public Law 480 does not affect that price. As a matter of fact, because of cost of transportation, the wheat which we get under this program is somewhat more expensive than ours, so we actually subsidize it to get it onto the market."

With the exporter paid in dollars and in kind, the deal as far as he and the Indian government is concerned is completed; but what happens to the rupee?

The rupees paid for our products remain almost entirely in India to be spent and loaned in various ways. A part of it goes

(*Continued on page* 116)

A FARM is seldom truly seen by farmers. Too soon the strangeness and wonder of the life and growth and reproduction are overlain with knowledge and familiarity and become commonplace. Last summer we saw reflected in the eyes of two Eskimo boys that which we have lost the power to see ourselves. For the very first time, they saw fields of growing crops; trees heavy with fruit; delicate purple blossoms of alfalfa; the wheat nested in a head of grain; huge, belching cows in their stanchions; ponds of water warm enough to get into, and feel with your hands; and trees to climb and snorting horses and squealing pigs to watch and be amazed at. They, Mathaus Godtfredsen and Ole Adamsen, had come to Ohio from Greenland to be a part of the Children's International Village—a camp for 11-year-old children held each summer in different parts of the world.

It had taken them three weeks to come from Narssak, Greenland. Icebergs and roaring winds had driven their boat back to their vast island home three times before they made it to open seas and on to America. This did not frighten them; they know the sea as the provider of fish, as well as the enemy of the fisherman. Harsh weather is a part of their lives. Winter lasts for ten months, and during the long days of their short summer they plant potatoes and carrots, and harvest the native grasses for winter feed for their sheep. When the shifting winds of spring melt the snow, the sheep are sometimes trapped by a sudden freeze. The boys have seen them anchored in ice so clear the moss on which they had been browsing can be seen, green and fresh beneath the ice.

They had never smelled a flower, nor climbed a tree, nor tasted fresh-picked fruit when they visited a farm a day or two after their arrival. Each living, growing thing was a matter of wonder to be sensed fully. They rolled in the pasture and picked a clover blossom to smell and taste; and picked a second to look at while they were tasting the first. They touched the rough hide of a pig and the satin lips of a pony. They chewed grains of the soft ripening wheat. They waded timidly into the pond for their first swim and held the water in their hands as though it too was strange and wonderful.

Their first experience on a farm was recorded by the use of a telephoto lens to catch their natural reactions without any camera shyness. This may have been an unnecessary precaution, for they were too excited with all the new sights and sounds and smells and tastes as the farmer, H. R. Lane, showed them the farm, to be concerned with a man holding a small, black box.

**Mathaus could hardly contain his excitement at the first sight of a cow. He was never quite sure they were friendly beasts. A warm pond was strange, too. In Greenland, water is either ice which must be melted for use, or the distant, turbulent ocean.**

# Eskimo Kids on a Corn Belt Farm

Photographs by Kazik Pazovski

Each flower and blade of grass must be studied, smelled, and tasted.

Basketball, too, was strange to them, but games come easy to children.

The boys dried out in our heat. H. R. Lane kept up a bucket brigade.

By John MacCallum

# DIESEL VS. GAS

AMERICAN-MADE diesel tractors were first introduced some ten years ago. Since then the percentage of diesels sold has steadily risen. In 1953, six percent of the tractors produced in the U. S. were diesels. In 1960, some 42 percent had diesel engines. And even these figures don't show the preponderance of diesel tractors in the large horsepower sizes. Sixty percent of tractors over 50 hp were diesels last year. In the 9 to 49 hp range, 27 percent used diesel fuel.

A comparative newcomer is the imported diesel, often a small tractor, and usually with no comparable gasoline model available. Most of them are not included in the U. S. production percentages above. Their addition would make the percentage of diesels even greater.

The American farmer, there is no doubt, has taken to the diesel hard—especially in the larger horsepower models. So hard, in fact, that some manufacturers no longer offer gasoline models in the 60-plus horsepower range. Nearly half a million diesel tractors are now chugging on U. S. farms, and half a million farmers can't be wrong, any more than 50 million Frenchmen.

Nevertheless the dispute between gasoline and diesel continues. One tractor engineer said, "I know some farmers are buying diesel tractors when the facts show they should be using a gasoline model. I can't understand why farmers are buying 30 hp diesels. We sell both, so I don't care, but they're going to have to drive them forever to break even with gasoline." Another argued, "The farmer is buying more diesels today than ever before. I believe the trend will continue. I don't believe the farmer is stupid—if you can't find an economic reason look for a mechanical one."

What are the facts, mechanical and economic?

Well, there's no doubt some farmers are paying extra for the deep-throated chuckle of a diesel engine in a tractor which they believe is saving them dollar after dollar in total cost. But their neighbor may be blithely plowing atop a gasoline model which works hard enough and long enough to merit the high initial investment for a diesel engine. The problem is: how do they find out before they buy?

Usually the diesel engine adds to the initial price, but diesel fuel is cheaper than gasoline, so running costs are down. And a gasoline tractor will use more fuel per hour on the same job because there is less energy in a gallon of gasoline than a gallon of diesel fuel:

| | Wt/gal. | Heat units/gal. |
|---|---|---|
| Regular Gasoline | 6.0 lbs. | 122,300 B.T.U. |
| No. 2 Diesel | 7.0 lbs. | 138,300 B.T.U. |

The harder you work a tractor, and the longer you keep it, the more a diesel engine will pay off. For the choice between gasoline and diesel models, the table opposite gives the purely economic analysis, showing the profit (black) or loss (white) from choosing the diesel. The figure is for the total difference, not the annual difference—so in many cases the actual difference in annual operating rates is small.

### Non-Economic Factors

In fact, the difference may be so little that it's tweedledum or tweedledee as far as money goes, and factors other than economic ones are important.

The basic difference between the gasoline and diesel engine is in the means of ignition. The gasoline engine uses a spark to ignite the fuel, the diesel uses the heat of compression. The diesel engine compresses air far more than the gasoline engine. This compression produces great heat. Into this hot air the diesel fuel is sprayed, and immediately ignites. By its nature, the ignition of the gasoline in an engine by a spark causes an explosion—a controlled explosion, but nevertheless one which gives the piston a strong, then diminishing surge of power. The injection of diesel fuel, however, gives a prolonged push: the fuel actually enters the cylinder over a span of time and burns as it enters.

These two actions provide the basic characteristics of the two engines—the gas engine responds quickly to a sudden increase in fuel supply. Push on the throttle and you'll get a surge of power fast. The diesel lacks this swift acceleration, but provides a somewhat smoother source of power—a surge rather than a burst.

Most tractor engines—diesel and gasoline—are four cycle. The four-cycle engine has one power stroke every two revolutions. The piston goes down under power, comes up to push out the burned gases. Beginning a new revolution of the flywheel, the piston goes down again, this time sucking in the new air (in the diesel); or air and fuel (in

**The chart (opposite) gives the approximate total cost difference for gasoline or diesel powered tractors over any number of years from two to ten. There are three groups—large tractors of about 60 horsepower, medium tractors about 48, and small ones around 32 horsepower. Select the appropriate group, and then pick the column for the difference in initial cost of the tractors, and the difference in fuel cost per gallon. Then, from the side, choose the line covering your hours of work per year, and expected years of use. The figures you arrive at in the body of the table give the total saving or loss from using diesel for the whole period, not annual differences. White figures mean a loss by choosing diesel, black figures a profit from diesel fuel.**

# Diesel versus Gasoline — a Comparison

Cents Difference in Fuel Cost/Gallon

Difference in Initial Cost

## LARGE TRACTORS

| Years of Use | Hours of Use/Year | 400 dollars 8 | 6 | 4 | 2 | 0 | 600 dollars 8 | 6 | 4 | 2 | 0 | 800 dollars 8 | 6 | 4 | 2 | 0 | 1000 dollars 8 | 6 | 4 | 2 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 400 hours | 120 | 68 | 24 | | | 28 | | | | | | | | | | | | | | |
| 4 | | 301 | 197 | 109 | 21 | | 148 | 44 | | | | | | | | | | | | | |
| 6 | | 491 | 335 | 203 | 71 | | 278 | 123 | | | | 54 | | | | | | | | | |
| 8 | | 696 | 478 | 302 | 126 | | 416 | 208 | 52 | | | 145 | | | | | | | | | |
| 10 | | 882 | 622 | 402 | 182 | | 558 | 296 | 75 | | | 230 | | | | | | | | | |
| 2 | 600 hours | 274 | 196 | 130 | 64 | | 182 | 104 | 38 | | | 88 | 10 | | | | | | | | |
| 4 | | 609 | 453 | 321 | 189 | 57 | 456 | 300 | 168 | 36 | | 299 | 142 | 11 | | | 145 | | | | |
| 6 | | 953 | 719 | 521 | 323 | 125 | 741 | 507 | 309 | 111 | | 526 | 292 | 94 | | | 314 | 80 | | | |
| 8 | | 1302 | 980 | 726 | 462 | 198 | 1032 | 720 | 456 | 192 | | 761 | 445 | 185 | | | 494 | 182 | | | |
| 10 | | 1652 | 1262 | 932 | 602 | 272 | 1326 | 936 | 605 | 275 | | 1000 | 810 | 290 | | | 680 | 290 | | | |
| 2 | 800 hours | 420 | 322 | 234 | 148 | 60 | 434 | 230 | 142 | 56 | | 240 | 136 | 48 | | | 148 | 44 | | | |
| 4 | | 907 | 705 | 529 | 357 | 181 | 1060 | 552 | 376 | 204 | 28 | 603 | 395 | 219 | 47 | | 449 | 241 | 65 | | |
| 6 | | 1403 | 1097 | 833 | 575 | 311 | 1687 | 885 | 621 | 383 | 99 | 982 | 670 | 406 | 148 | | 772 | 458 | 194 | | |
| 8 | | 1904 | 1494 | 1142 | 798 | 446 | 2340 | 1224 | 872 | 528 | 176 | 1369 | 953 | 601 | 257 | | 1102 | 686 | 334 | | |
| 10 | | 2406 | 1892 | 1452 | 1022 | 582 | 2988 | 1566 | 1125 | 695 | 258 | 1760 | 1240 | 800 | 370 | | 1440 | 920 | 478 | 46 | |
| 2 | 1000 hours | 580 | 450 | 340 | 230 | 120 | 488 | 358 | 248 | 138 | 28 | 394 | 284 | 154 | 44 | | 302 | 172 | 62 | | |
| 4 | | 1221 | 961 | 741 | 521 | 301 | 1060 | 808 | 586 | 368 | 148 | 911 | 681 | 431 | 211 | | 757 | 487 | 277 | 57 | |
| 6 | | 1871 | 1481 | 1151 | 821 | 491 | 1659 | 1260 | 939 | 609 | 279 | 1444 | 1054 | 724 | 394 | 64 | 1232 | 842 | 512 | 182 | |
| 8 | | 2526 | 2006 | 1528 | 1128 | 696 | 2256 | 1736 | 1290 | 856 | 416 | 1985 | 1465 | 1025 | 585 | 145 | 1718 | 1196 | 758 | 318 | |
| 10 | | 3182 | 2532 | 1982 | 1432 | 882 | 2856 | 2206 | 1653 | 1105 | 556 | 2530 | 1880 | 1330 | 780 | 230 | 2210 | 1560 | 1008 | 458 | |

## MEDIUM-SIZE TRACTORS

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 400 hours | 84 | 38 | 0 | | | | | | | | | | | | | | | | | |
| 4 | | 229 | 137 | 61 | | | 76 | | | | | | | | | | | | | | |
| 6 | | 393 | 245 | 121 | 17 | | 171 | 33 | | | | | | | | | | | | | |
| 8 | | 542 | 359 | 206 | 54 | | 272 | 88 | | | | 1 | | | | | | | | | |
| 10 | | 702 | 472 | 282 | 92 | | 376 | 148 | | | | 50 | | | | | | | | | |
| 2 | 600 hours | 218 | 150 | 82 | 34 | | 128 | 58 | 0 | | | 32 | | | | | | | | | |
| 4 | | 497 | 361 | 245 | 129 | 17 | 344 | 200 | 92 | | | 187 | 51 | | | | 33 | | | | |
| 6 | | 785 | 581 | 407 | 233 | 65 | 573 | 369 | 195 | 21 | | 358 | 154 | | | | 148 | | | | |
| 8 | | 1078 | 806 | 574 | 342 | 118 | 808 | 536 | 304 | 72 | | 537 | 285 | 33 | | | 270 | | | | |
| 10 | | 1372 | 1032 | 742 | 452 | 172 | 1046 | 706 | 415 | 125 | | 720 | 380 | 90 | | | 400 | | | | |
| 2 | 800 hours | 352 | 262 | 186 | 108 | 30 | 280 | 170 | 94 | 18 | | 186 | 76 | 0 | | | 74 | | | | |
| 4 | | 765 | 585 | 433 | 277 | 121 | 612 | 432 | 280 | 124 | | 455 | 275 | 123 | | | 301 | 121 | | | |
| 6 | | 1187 | 917 | 689 | 455 | 221 | 975 | 705 | 477 | 243 | | 780 | 490 | 282 | 28 | | 548 | 278 | 50 | | |
| 8 | | 1614 | 1254 | 950 | 638 | 328 | 1344 | 984 | 680 | 388 | | 1073 | 713 | 408 | 97 | | 806 | 448 | 142 | | |
| 10 | | 2042 | 1592 | 1212 | 822 | 432 | 1716 | 1266 | 885 | 495 | | 1390 | 940 | 580 | 170 | | 1070 | 620 | 238 | | |
| 2 | 1000 hours | 486 | 374 | 278 | 182 | 94 | 384 | 282 | 196 | 80 | | 300 | 188 | 92 | | | 208 | 96 | 0 | | |
| 4 | | 1033 | 809 | 617 | 425 | 229 | 860 | 658 | 464 | 272 | | 723 | 490 | 307 | 115 | | 588 | 345 | 153 | | |
| 6 | | 1589 | 1253 | 965 | 677 | 393 | 1377 | 1041 | 753 | 485 | | 1182 | 828 | 538 | 250 | | 950 | 614 | 328 | | |
| 8 | | 2150 | 1702 | 1318 | 934 | 542 | 1880 | 1421 | 1048 | 664 | | 1600 | 1161 | 777 | 393 | | 1342 | 884 | 510 | | |
| 10 | | 2712 | 2152 | 1672 | 1192 | 700 | 2388 | 1826 | 1345 | 865 | | 2080 | 1500 | 1020 | 540 | | 1740 | 1180 | 699 | | |

## SMALL TRACTORS

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 400 hours | 8 | 24 | 50 | 76 | 104 | | | | | | | | | | | | | | | |
| 4 | | 77 | 13 | 39 | 95 | 147 | | | | | | | | | | | | | | | |
| 6 | | 155 | 58 | 19 | 103 | 181 | | | | | | | | | | | | | | | |
| 8 | | 230 | 110 | 8 | 106 | 210 | | | | | | | | | | | | | | | |
| 10 | | 322 | 182 | 32 | 108 | 236 | | | | | | | | | | | | | | | |
| 2 | 600 hours | 106 | 58 | 18 | | | | | | | | | | | | | | | | | |
| 4 | | 273 | 177 | 97 | 17 | | | | | | | | | | | | | | | | |
| 6 | | 449 | 305 | 185 | 65 | | | | | | | | | | | | | | | | |
| 8 | | 630 | 438 | 278 | 118 | | | | | | | | | | | | | | | | |
| 10 | | 812 | 572 | 372 | 172 | | | | | | | | | | | | | | | | |
| 2 | 800 hours | 204 | 140 | 86 | 32 | | | | | | | | | | | | | | | | |
| 4 | | 489 | 341 | 233 | 125 | 17 | | | | | | | | | | | | | | | |
| 6 | | 743 | 551 | 388 | 227 | 65 | | | | | | | | | | | | | | | |
| 8 | | 1022 | 766 | 550 | 334 | 118 | | | | | | | | | | | | | | | |
| 10 | | 1302 | 982 | 712 | 442 | 172 | | | | | | | | | | | | | | | |
| 2 | 1000 hours | 302 | 222 | 154 | 86 | 18 | | | | | | | | | | | | | | | |
| 4 | | 665 | 505 | 369 | 233 | 97 | | | | | | | | | | | | | | | |
| 6 | | 1037 | 797 | 593 | 389 | 185 | | | | | | | | | | | | | | | |
| 8 | | 1414 | 1094 | 822 | 550 | 278 | | | | | | | | | | | | | | | |
| 10 | | 1782 | 1392 | 1052 | 712 | 372 | | | | | | | | | | | | | | | |
| | | 8 | 6 | 4 | 2 | 0 | 8 | 6 | 4 | 2 | 0 | 8 | 6 | 4 | 2 | 0 | 8 | 6 | 4 | 2 | 0 |
| | | 400 dollars | | | | | 600 dollars | | | | | 800 dollars | | | | | 1000 dollars | | | | |

Cents Difference in Fuel Cost/Gallon

Difference in Initial Cost

a conventional gasoline engine). The last stroke is the upward push, when the gases are compressed before ignition and the next power stroke.

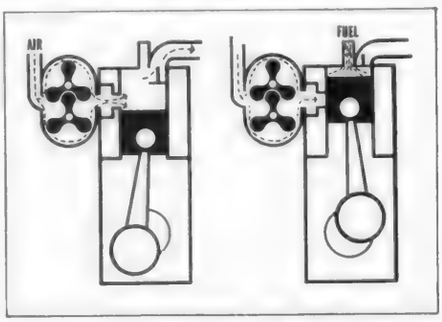
The two-cycle engine has a power stroke every revolution. It manages this by blowing air into the cylinder when the piston is at the bottom of its stroke. The burned gases are pushed out ahead of the incoming fresh charge and then it injects fuel into this clean air.

One design of the two-cycle engine was patented by General Motors. It uses a blower to pump in the fresh air. Two-cycle diesels have had wide application in industry. It is almost the only diesel used in locomotives. It is widely used in trucks and in agriculture. Allis-Chalmers used one model of this two-cycle diesel for many years—from 1939 to 1952. Oliver was an early user. John Deere used two-cycle diesels in 1960. Today John Deere's 8010, Massey-Ferguson's 98 and Oliver's 1900 are all powered by two-cycle diesels. Two other major companies are field-testing models using two-cycle diesel engines.

The two-cycle diesel is more expensive than a regular agricultural four-cycle diesel found in most wheel-type farm tractors. But it has considerably longer life, and the two-cycle engine is a smooth producer of power. L. W. Randt, Oliver Corporation engineer, said: "The two-cycle engine has the rapid throttle response of the gasoline engine together with the smooth lugging ability of the diesel."

Gasoline engines tend to foul up during idling, whereas the diesel runs clean at low speeds. Dirty spark plugs and valves are common on gasoline tractors used for general purpose work around the farm where they are seldom at full load. Gas engines are not efficient running at low speeds, the fuel doesn't all burn, but turns to carbon and other products, causing fouling. But don't let this *alone* persuade you to buy a diesel tractor for general purpose work. It usually won't pay as you don't put many hours of work into such a tractor and therefore use little fuel.

The diesel is very efficient with fuel at idling speeds. To give an extreme example, in Arctic expeditions the diesel tractors have been left running overnight to avoid the problem of starting in the 70° below weather. They use very little fuel. Cold weather starting may be a problem even in the United States. Some early diesels were practically impossible to start in cold weather. The compression of air by the piston did not develop enough heat to ignite the fuel injected at the top of the firing cycle. This was overcome with a combination of several engineering changes: glow-plugs—which lit the fuel during starting—and easy-to-ignite fuels, like ether, squirted into the engines. Special injection techniques were designed. Pre-heating the engine air has been used. And last, but quite important, an adequate battery is a big part of the starting mechanism of a diesel. It must have power to turn the engine at the proper speed against the resistance of cold lubricants. Modern diesels don't usually have much trouble starting, though in winter they *are* heavy on batteries. Some farmers still leave diesel tractors in the shed for the winter. They need not.




**Burned gas expulsion and fuel injection occur in a single revolution of the two-cycle engine.**

### Repairs

The diesel will require repairs less often than the gasoline engine, but when they are needed they will be more expensive, so total repair costs work out roughly the same for both. The diesel is not any more difficult to repair on the farm, but a trained mechanic with special equipment is necessary. But the increase in diesel tractors means more diesel-trained men are available. Many engineers, though, claim the diesel engine is usually in better shape—just because the farmer *can't* repair it. The majority of gasoline tractors are not as well cared for as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* Based on diesel fuel cost of 14.8 cents per gallon.

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Cobey 51-B SELF-UNLOADING FORAGE WAGON

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The Cobey 51-B is a straight self-unloading Forage Wagon.

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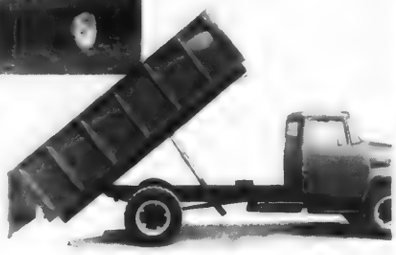

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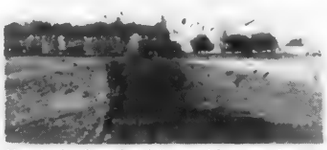

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they might be. There is less chance of poor workmanship or neglect with the diesel if it is regularly repaired by a skilled mechanic.

Neither gasoline nor diesel engines like dirty fuel. The diesel can't take dirty fuel and usually can't use gasoline. Either will damage the diesel injection pump, which is a highly expensive, accurate and finely-balanced metering device. Nearly all diesel engines now have two or three filters to cut out dirt. A gasoline engine is more tolerant of fuel variation, not that dirty fuel does it any good. Furthermore, diesel fuel will require a separate storage tank—an added expense (allowed for in the table).

Diesel fuel is more stable, won't spoil as gasoline can. Gasoline forms gums after long storage, and these gums can foul intake valves and carburetor floats. This is especially a danger if a farmer has too big a tank. Six months should be the storage limit.

### Working Hours

A factor that is more psychological than economic, is that most farmers overestimate the hours of work they'll do with a new tractor. This tends to set them economically on the side of the diesel. If you're lucky enough to have an hour meter on your present tractor you know how much work it does. If you don't, remember most tractors average less than 600 hours a year. Only one farmer in 10 uses any single tractor 800 hours or more a year. And it is unusual to find a farmer who uses a tractor more than 800 hours a year unless he has a hired man.

The trend in tractor use in hours per year is down, not up. So if you are on the borderline, use the low figure. There are several reasons for the downward trend: Big new tractors are not used for small jobs so they tend to work less per year. And, since they are more powerful, they do more work in an hour and get through the same work in less time than a smaller tractor.

Another thing is that farmers do not sell their old tractors. Almost every tractor built is on someone's farm somewhere. The old model gets into specialized jobs—such things as cornpicking or manure handling, where the picker or loader is left on the tractor year-round. And the increase in self-propelled sprayers, loaders, windrowers and cornpickers reduce tractor work. The University of Illinois did a survey of 25 tractors averaging 40 horsepower in 1960. They did 350 hours work each per year.

When you get a new tractor the old one tends to be used less. Farmers usually keep their prime tractor five years before buying another. A tractor is seldom used as many hours in its sixth year as in its first. You must allow for this in figuring hours of use—the figure must be a true average for the whole life of the tractor.

### The Figures in the Table

Several tables comparing gasoline and diesel have been published. By juggling the basic assumptions, any table can make diesel look better (or worse) compared to gasoline.

One factor which will vary from table to table is the interest rate charged on the initial investment. This table, prepared by Professor J. A. Weber, University of Illinois, Department of Agricultural Engineering, uses 6½ percent. Some tables use the interest rate the dealer charges the farmer, which may soar to 19 percent. Others use the interest on land mortgages, usually around five percent. High interest rates hurt the diesel because of its higher initial cost. It is not too big a factor—at $1,000 difference in first cost, 6½ percent is less than $3.50 for ten years. But the interest charged will give an indication of the bias of the table. A high interest rate usually means the table aims to favor gasoline.

Incidentally, the initial cost difference between diesel and gas engines has been falling. Low-cost diesel imports selling at around $100 to $200 more than a U. S.-made gas model of the same horsepower are common on the eastern seaboard and the South, and in eastern Canada. Imports made by, or for, American companies overseas are also a big factor. They have a lower price than home-made diesels and they have forced down the diesel price. Another influence has been new designs of injection pumps that are cheaper to build. The injection pump common several years ago had a separate piston pump for each cylinder of the diesel engine. Now, however, there are several kinds. One uses a single piston and a distributor to lead the fuel to the right engine cylinder. Another mounts the separate injector pistons right above the engine, cutting

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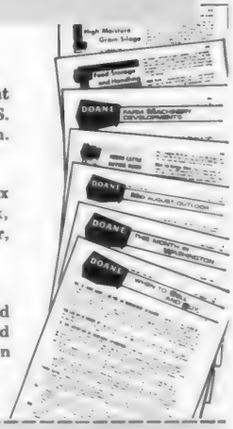

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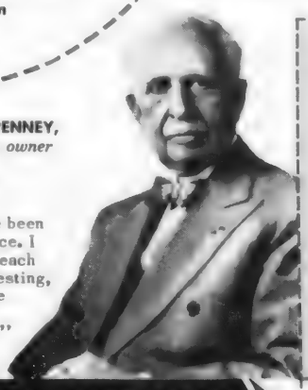

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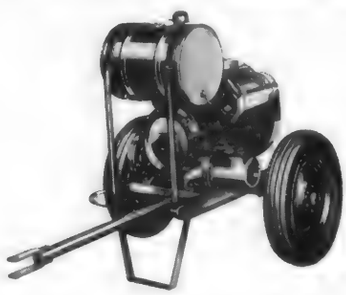

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out the high pressure fuel lines. In almost any case it pays to buy diesel when the extra cost is as little as $200, as you would only need about 200 hours' use a year to save money. As a very rough rule of thumb, you need one hour per year working time for each dollar difference—so it would take 1,000 hours of work a year to justify an extra $1,000 for a big diesel. Above 80 horsepower, figure one hour for each $2.00.

The increasing number of diesels has another effect, that of stimulating the makers of gasoline tractors in efforts to improve the performance of their engines. Many surveys of gasoline tractors have been taken and show a majority of gasoline tractors are out of adjustment. A Kansas study of the performance of 50 gasoline and LP-gas tractors showed 45 needed new spark plugs, 36 needed carburetor adjustments, 27 need timing changes, 40 needed governor adjustments or repair. They were using 1.32 times as much fuel as they had used in their Nebraska tests, and simple adjustments improved this almost 20 percent.

The competition from diesels will make manufacturers and dealers more conscious of the need for better maintenance of gasoline models. It may lead to new engine designs; there has been talk of fuel injection engines for gas tractors. Already, compression increases have been developed to improve fuel consumption of tractor gasoline engines. The farmer will be under pressure to have his tractor properly maintained by regular, skilled servicing. It may also stimulate manufacturers to design gasoline engines which need adjustment less often. And, one should add, the increasing use of diesel engines may tempt legislators to tax diesel fuels.

### Price Differences

The actual price differences between gasoline and diesel vary across the nation, even from town to town. Some recent price variations were:

| | Gasoline | Diesel No. 2 |
|---|---|---|
| Fargo, N. D. | 18.6¢ | 16.5¢ |
| Syracuse, N. Y. | 17.4 | 16.0 |
| Hartford, Conn. | 15.6 | 15.2 |
| Atlanta, Ga. | 16.9 | 17.2 |
| Louisville, Ky. | 16.7 | 17.4 |
| Los Angeles, Calif. | 17.8 | 14.3 |
| Texas | 17.4 | 14.3 |

Diesel fuel varies from 2½ to 4 cents a gallon less than regular gasoline in most areas. Don't be misled by signs on gas stations which show a discounted price for diesel to encourage trucks, yet advertise the normal price on gasoline—though they'll discount gas for trucks, too. This technique exaggerates the price difference in the two fuels. However, the difference runs as high as 7½ cents in Hawaii. In some places gasoline may cost slightly more than diesel fuel.

How about the difference in tractor initial costs? This varies widely between manufacturers. The following figures are for the major manufacturers of wheel tractors in the U.S. We list only the difference between gas and diesel engines, as differences in standard equipment prevent fair comparison of the retail price in this limited space.

| | |
|---|---|
| 30 to 40 horsepower: | |
| Lowest extra cost of diesel | $361.50 |
| Average extra cost of diesel | 554.00 |
| Highest extra cost of diesel | 760.00 |
| 40 to 60 horsepower: | |
| Lowest extra cost of diesel | 449.75 |
| Average extra cost of diesel | 627.40 |
| Highest extra cost of diesel | 785.00 |
| 60 to 80 horsepower: | |
| Lowest extra cost of diesel | 600.00 |
| Average extra cost of diesel | 764.30 |
| Highest extra cost of diesel | 895.00 |

Making the choice between diesel and gasoline using the table alone is the easy way out—and big errors aren't likely if you have the right cost figures. On the borderline economic cases one of the other factors may decide which engine you choose. If you are still undecided, remember the diesel sounds more powerful, but the gasoline exhaust smells better!

*Marshall Bros. Hatchery, Ithaca, N.Y. 9,500-bird, insulated and automated laying house of tilt-up concrete. Cost: about $3.50 per bird.*

*Tilt-up concrete dairy barn on Ivo Goettemoeller's farm at St. Henry, Ohio, was built at a total cost of only $1.17 per sq. ft. of floor area.*

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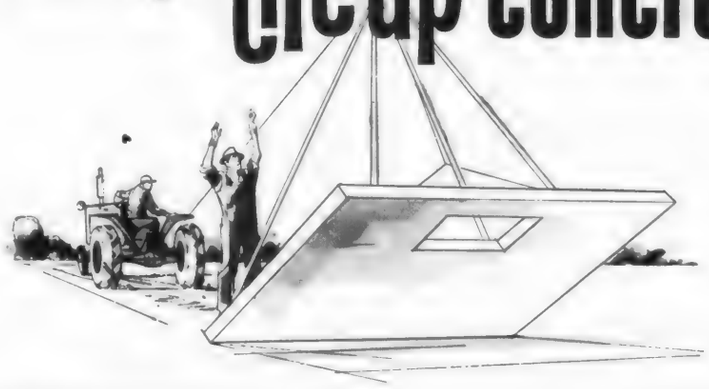

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*This tilt-up concrete machinery shelter has the added advantage of a "folded plate" concrete roof, just 4 inches thick. The building is one of a number built on the Garden City Company farm near Holcomb, Kansas. A 24-ft. by 32-ft. column-free interior permits free access to stored machinery. Designed by Robert E. Cobb, Architect & Engineer, Garden City, Kansas.*

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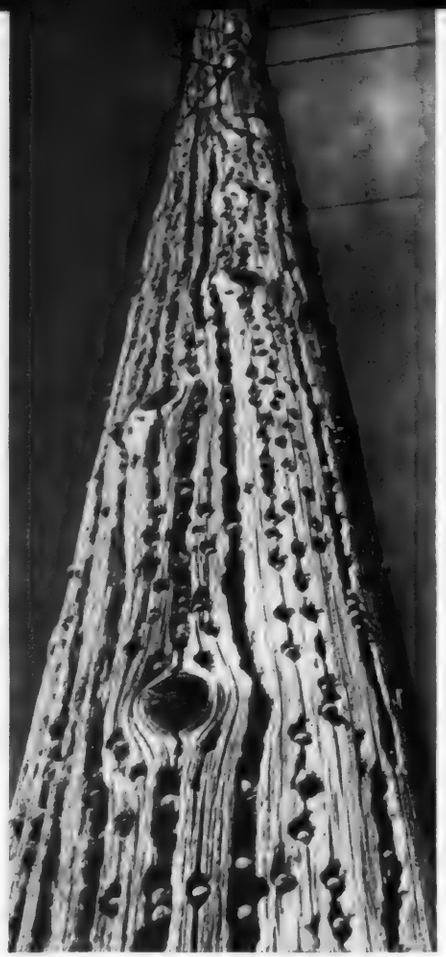


# This Co-op is for the Birds

By Joseph Muir

ANYONE PASSING a group of oak trees in California's foothills may hear a nasal, grating call which bird watchers interpret to be "jay cup, jay cup." Looking up, they will see a red and black bird which has a common, woodpeckerish look but whose habits make it one of the most unusual birds to spread a wing. A *rara avis,* the bird watcher would say—and he would be right.

More like a farmer than a bird, this creature harvests a crop each year and stores it for the winter months. He forms cooperatives to do the job and, like American farmers today, he often fails to judge his needs and piles up huge surpluses. Some say he also does a little livestock farming; though the experts scoff at this.

The Redheaded California Woodpecker (*Balanosphyra Formicivorus Bairdi*), a noisy, gregarious bird common to the oak belt of California, Oregon and Arizona, has been hoarding acorns since the time of the giant ground sloth and even before then.

To store his acorns, this odd woodpecker drills holes in certain forest trees such as the live, valley and coast oaks, the sycamore, and yellow pine; then stuffs the holes with acorns. Since the coming of civilization to the woodpecker's land, he has broadened his storage receptacles to include fence posts, telephone poles, cornices, church spires—in fact any wooden structure where he is permitted to work, if it is close to an acorn supply. A crop failure of acorns, incidentally, has never been recorded.

Most of the acorns stored are taken from the tree before they fall to the ground. The bird flies to the acorn, grasps it with its beak, wrenches it loose from the cup with a twist, and flies to the hole it has drilled. The acorn is placed in the hole with the small pointed end down. Then the woodpecker begins to whack it in with his beak with a jackhammer tempo until the acorn fits so snugly very few of the natural acorn thieves can dislodge it. It is usually set far enough in the hole to be either countersunk or flush with the surface. Not all the acorns that fall to the ground are wasted. After most of the tree harvest is in, the woodpecker begins to gather them from the ground.

With such a precision fit, the big question is whether the hole is bored for the individual acorn or the acorn is selected to fit the already bored hole. Dr. W. E. Ritter, of the University of California Zoology Department, in 1929 made the discovery that the storing holes are made to fit the size of the acorns they are to receive. This means the birds survey the crop and the specific acorns, then begin their labor of drilling holes. And still more amazing is their ability to select only the sweeter acorns without breaking the shell to taste them.

No one knows how these woodpeckers became acorn hoarders. But, the fact is indisputable, they are. These redheaded birds have taken it for a life's work to embed all the acorns, one by one, in appropriate wooden niches, so long as life shall last. Instinct makes this their bounden duty, meat, religion and destiny.

They are rewarded for this industrious habit of storing their favorite food, acorns, which form over 50 percent of their diet, by not having to face the hazards and exertion of migration. The plentiful supply of acorns and the ever normal granary these birds have devised also makes possible the existence of communities. Thus, they live among the oaks the year round along the Pacific coast from lower California and parts of Arizona north into western Oregon.

The California woodpecker is a social bird and his hoarding is done by cooperation of the entire community both in the harvest of the acorns and in the defense of their stores. Each community resides in a comparatively small area, say within a square mile, in which they are found. Even though they are restless, energetic birds, their stay-at-home habits are pronounced.

(*Continued on page* 111)

**A telephone pole (above) is converted into a bird granary by drilling holes and filling them full of acorns. The Redheaded California Woodpecker (right) runs a food storage co-op which has eliminated the need for annual migration.**

# Wet Corn in a Trench Silo

By John Jeffers

"THIS WILL BE the fourth year we've put up more than 30,000 bushels of wet corn in a trench silo. As you can see, we get no spoilage at all," said John DeKock. He dug down with his hands, underneath the plastic cap which sealed the top of the 30-foot wide silo and pulled out a double handful of the moist, yellow corn. It had the characteristic odor somewhat reminiscent of sour mash. The corn was in perfect condition right up to the plastic cap. DeKock carefully re-covered the hole he had made, pushing the grain down, covering it with plastic, and brushing back the spoiled silage which lay on top of the plastic.

"Back in 1958 Dad figured that if they were storing wet corn in regular upright silos, why couldn't we do it in a trench. After all, silage seemed to work equally well in upright or trench silos. That first year we put about 30,000 bushels of ground ear corn in this trench and, boy, we were really sweating it out. Dad was up here every day checking. He'd climb up here on top of the silo and dig around to see how the corn was keeping. But it worked, and it's worked fine every year since."

John and his brother, Ralph, farm 985 acres as DeKock Brothers at Fair Oaks in northern Indiana. John is the farmer, handling the field crops—they have 800 tillable acres of which 600 are in corn; Ralph is the cattleman feeding and handling the 1,000 head of cattle they finish every year. Their father, Ralph Sr., who owns the farm, is still busy in the operation although by his own assessment, he "used to work a lot harder when these boys weren't so big."

The two brothers are almost a pair; quiet, easygoing men, both with caps pulled firmly down their foreheads. They are ready, but not overeager to talk about the successes of their operation. Their father wears a hat, and a more even assurance that perhaps comes with age, although he doesn't show the years that must have passed. He resembles neither of the sons as much as they resemble each other. One might, in fact, mistake him as an elder brother to the "twins."

"We tried ground ear corn only once, the first year," said John DeKock. "We were late with the harvest that year, but we put over 30,000 bushels in this trench. It didn't fill the trench much past half way. We added water to all of it as it was getting a little dry.

"The second year we went to shelled corn. We just didn't figure ear corn was worth the extra labor at harvest. The procedure was a little different, too; we'd bring

**Ralph DeKock scoops wet corn from the open face of a trench silo. The DeKocks feed around 1,000 head of beef cattle each year, last year they stored 35,000 bushels of wet corn.**

### Wet Corn in a Trench Silo

Several farmers have successfully stored wet corn in horizontal silos. Both trench and bunker silos have been used to store both ear corn and shelled corn. There was very little spoilage, but proper care is vitally important. The corn must be ground, and the silo must be covered with plastic and sealed tightly, either by covering the plastic or weighting it with tires. The face is left open when feeding the corn and no spoilage occurs if corn is carefully taken from the whole face regularly. Silos containing from 900 bushels to 35,000 bushels have been successful, but good management is vital.

### Grain Head Silage

(Next page)

Head silage can be made from corn, oats or milo. The crop is cut when the grain is in the dough stage, and only the top of the plant is ensiled. By varying the height of cut, the grain in the silage can be changed from 50 to 80 percent. Thus the silage can be adjusted to different kinds of animals. In the South and Southwest it is possible to get two crops of milo a year, or one of oats and one of milo. This can be done in a growing season of 180 days. Harvesting losses are reduced. The technique may give the South and West feed to compete with corn.

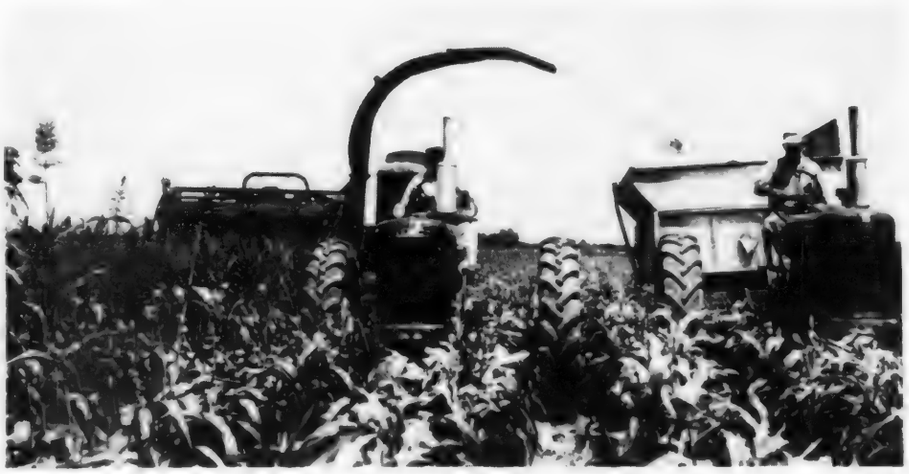
shelled corn in from the field and grind it right there in the silo, blowing it onto the pile. The first year we harvested into a crib and ground out of the crib, but that was too much work, and not necessary.

"We have a John Deere 45 combine picker-sheller and, of course, we just dumped into trucks in the field, brought the trucks to the silo, backed them up to the grinder, which is a Letz 50X with a blower on it, and blew it up onto the pile. After three or four loads, or maybe once a day, we'd take the bulldozer up on top of the pile and level it off. As we work, there's quite a slope on the corn in the silo, but when we finish we try to get the end up pretty steep. After we get a strip done we cover it with the plastic. We don't cover it every night while we're filling, but we do cover it over the weekends. Last year, corn harvest took us about seven weeks. We used clear plastic—we got it cheaper—it's 4-mil and it only lasts one year. We used old plastic one year and we got some spots where water seeped through holes in the plastic and discolored a small area of grain around the holes, but there wasn't any extensive damage, just some discoloration of the grain. On top of the plastic we put 6 inches to 8 inches of spoiled corn silage, the spoilage from the top of the corn silage in the trench alongside. We sealed down the ends and the sides real well and added a few tires for weight, too. And that's about it until we started to feed, which was pretty soon after we finished filling. The only problem is the squirrels that chew up the plastic to get at the grain. That's the only trouble about having all the woods round here."

The silo they used is one of a pair dug into a sandy mound in the wooded area which surrounds their feedlot. Both silos have a concrete bottom and wooden walls. The walls are planks stretched between heavy creosoted poles which were originally vertical, and the extremely sandy soil of the hillside was dug back from the outside of the silo. However, the pressure of the grain has pushed the walls outward until they now slope, although still at a steep angle. As the DeKocks fill the silo they shovel sand down outside the walls to withstand the pressure of the grain. This causes problems when the grain is removed because the sand then tends to break the wooden walls inward. The DeKocks have had to make repairs in a couple of places. However, since the whole silo cost them only about $2,500, they have every reason to be satisfied.

"There are two secrets to putting this wet corn into a pit," said Ralph DeKock, the father. "One is to grind the corn and the other is to cover it properly. You see, this is ground shelled corn, and by grinding I get fines—the grain won't seal properly without it. I wouldn't want to use whole shelled corn. The ground grain knits together and packs down tight, so even if there is a hole somewhere, the grain seals off the air and water from leaking down very far. And

(*Continued on page* 146)



# GRAIN HEAD SILAGE

"WE'RE CRAZY about head silage" said Shelton Segrest, Mississippi farmer and cattle feeder. "I believe it's going to be the answer for feeders in the South. You know, we've never been able to produce corn down here on a large scale for cattle feeding, but this soft grain milo silage looks like it might be the solution." Head silage is a high grain silage, harvested by cutting milo, oats or corn just beneath the grain head, about 30 inches from the ground.

Segrest, a tall, firm-faced Southerner, is one of four brothers who, with their father, farm 4,000 acres at Port Gibson, Mississippi. He is one of the largest cattlemen to test this new idea in grain harvest, head silage. Last year he filled two trench silos with a total of 2,600 tons of milo, harvested at the soft grain stage, and cut with a specially adapted forage harvester. Why the special adaption? Well, the idea is to cut only the head of the milo, plus as much stalk as you need. And, by varying the height of cut, the resulting silage can change from 50 percent grain when the whole plant is taken, to as much as 80 to 85 percent grain when the stalk is cut immediately under the head. Thus you can change the silage to fit the livestock. Feeder cattle might use a 60 to 70 percent grain silage; the cow herd and bulls may use the 50 percent grain crop.

**Milo head silage is cut (above) with a forage harvester raised by using a false axle to cut at 36 inches. Only the grain ear and part of the stalk is taken, as Dr. Hogg (below) demonstrates on oats. The crop may provide the South and Southwest with a competitor for Midwest corn.**

But we haven't begun to explore all the advantages of the head silage concept. Dr. Peter G. Hogg of the Delta Branch Experiment Station at Stoneville, Mississippi, originated the idea, and he explained: "Corn and milo and oats in this area suffer excessive field losses before harvest because of storms, bird and insect damage, and untimely harvesting. They are neglected in favor of cotton and often stay in the field too long. You can avoid much of this loss if you can harvest these grains as soon as they

(*Continued on page* 141)

# NFO demands collective bargaining

By Christopher Kelly

AGRICULTURE'S MOST persistent problem is marketing. The solution is collective bargaining. This is the message of the National Farmers Organization, America's youngest and, currently, one of its most vociferous farm groups.

The NFO is an association of farmers whose object is basically to stabilize marketing activities in farm products through their own united efforts. "Collective Bargaining for Agriculture" is their battle cry. The organization seeks to be the marketing agent for the farmers. Instead of labor's most potent weapon, the strike, the NFO has resorted to the use of the "holding action," an attempt to try to force buyers and processors to come to terms by withholding the farmers' products from the market. More of that later. All officers, organizers and members of NFO are farmers.

The NFO started in 1955 when a feed salesman by the name of Jay Loghry began leading a farmers' protest against 12-cent hogs around the auction barns in the vicinity of Corning, Iowa. Headquarters for NFO is still at Corning, in a long, narrow, high-ceilinged, old store building.

Given the conditions prevailing at that time, the response to Loghry's protests was like dropping a lighted match into a pile of excelsior. Many prominent farmers joined up and even ex-governor Daniel Turner, who had presided over Iowa's political life during the disastrous days of the early '30's, became a leader in this new movement. By spring of 1956 the organization, if such it could be called at this stage, boasted 180,000 members, each of whom had pledged his support with payment of a $1 membership fee.

It was about this time that Oren Lee Staley, the present evangelistic leader, made his first contact with the group. Staley is now 37. In contrast to the lean, hungry and harassed look of the run-of-the-mine professional protester, Oren Lee is the roly-poly type, dark, with a winning smile and a downright warm personality. He is a farmer rather than a professional organizer, though it is a question how long he can maintain this status under current pressures. He attended Northwest Missouri State College. With his wife and three children he lives at Rea, Missouri, where he farms some 400 acres, has a herd of Shorthorn cows, and feeds some hogs. As president of NFO he receives a salary of $175 per week.

"I was just a kind of curiosity seeker at one of the sales barns where one of the protest meetings was held," he says in describing his introduction to NFO. "The place was packed and everybody was pretty mad about the prices we were getting. I decided it was certainly worth a buck to support any group of farmers who had the gumption to try to do something about those absolutely ridiculous prices."

But the infant organization soon found that if it were actually to accomplish any-

**"Farmers must have an organization as effective as industry in pricing its products, as effective as labor in bargaining," Oren Lee Staley, president of NFO, tells an audience deeply concerned over depressed livestock markets.**

thing, the membership fees of a dollar were as ridiculous as the prices farmers were getting for their products. So the dues were raised to $5 and eventually to the $25 scale which prevails today.

It was also found that what the organization needed as much as funds was stability of membership. So the present membership agreement calls for a three-year term.

At its 1957 convention the organization passed a resolution directing its president to appoint a committee to work out a plan for collective bargaining. Staley was elected president, which office he has occupied ever since, and what had been up to that time a somewhat nebulous organization, began to take on form and acquire direction.

"We stumbled and fooled around," Staley says, "and finally decided that what we needed to do was to organize our people and get agreements with processors under which we would deliver stated numbers of livestock at definite times and stipulated prices. We felt, and we still feel, that our basic problem is that the farmer has no voice in the pricing of his products. We wanted to get ourselves into a position where we would be as effective as industry in pricing, as effective as labor in bargaining. Besides, we wanted eventually to have the right to substitute a checkoff for dues.

"A few of us went up to Washington as a delegation to try to find out what kind of legislation we'd need to achieve these objectives. And to our surprise we found we didn't need a thing. We had all the authority we needed in the Capper-Volstead Act passed back in 1922."

That act gave agricultural cooperatives the right to act collectively in marketing their agricultural products without violating the anti-trust laws. Resting on this assurance of the legitimacy of its aspirations, the subsequent history of the organization has been largely the story of its efforts to organize farmers. It now has members in 12 states including Iowa, Missouri, Illinois, Indiana, Wisconsin, Minnesota, Ohio, Kentucky, South Dakota, Nebraska, Kansas and Idaho; or, as it claims, in 325 of the nation's 500 leading agricultural counties. The number of its members it will not disclose. "We have a fight on our hands," says president Staley, "and like any good fighting unit we're not going to disclose our numbers to the opposition."

NFO's position in regard to the established farm organizations, the Farm Bureau, the Farmers Union and the Grange, is one of neutrality. Those organizations take a similar official position toward NFO though there have been instances of unofficial endorsement of, or opposition to, the NFO by members of the older associations.

The NFO hopes to achieve its objective of orderly marketing of agricultural prod-

**Collective bargaining for agriculture is the battle cry of the NFO. No one voices it more vigorously than Staley. While he talks, his listeners assume attitudes of query, reflection, agreement; and attention seldom flags.**

ucts through contracts with processors. But the processors are not exactly sitting around waiting for the moment when they can sign on the dotted line. First, the NFO, or any outfit which suggests such a scheme, is going to have to prove it commands the allegiance of sufficient farmers to make it worthwhile for the processor to negotiate a contract. Second, the facts of economic life being what they are, the processors will have to be shown that it is to their advantage to sign. That is where the holding action comes into the picture.

To accomplish the first step, the NFO has been holding organizational drives throughout the Corn Belt and dairy regions. Here, it claims, are produced 80 percent of the nation's hogs, 75 percent of the corn and soybeans, and a high percentage of the milk and fat cattle. If, the argument goes, this area can be highly organized, prices can be controlled the nation over.

Organization proceeds thus: A trained organizer for the group comes into a county and arranges to hold a series of meetings on say, 10 nights. Eight to 10 farmers are invited to each of these meetings. No blatant publicity is used. "We want those fellows to hear us first," Staley says. "If we had a lot of publicity the opposition would have a chance to give us a black eye before we got started. After about 10 meetings the whole county is usually talking about NFO and then we go to work in earnest." A county is chartered after 25 members have signed up. After about 100 are signed a leader is selected.

As this goes on in county after county and state after state, the NFO prepares for its next step, the holding action. A holding action is a kind of strike in which the organization, through its county bargaining committees, sets target prices for farm products and asks its members and all other producers to refuse to market the stipulated products except at these prices.

Actually, the establishing of the prices is not the prime object of the holding action. What the NFO is really after is processor contracts. They want a few big processors to say, "OK, we'll buy 25,000 hogs a week from your people for the next three years for $22 per hundred," and to sign on the dotted line to that effect.

The holding action has become almost synonymous with NFO. The strategy behind it is literally to starve the processors in their supply of livestock. (The NFO looks upon the holding action as a way to bring the processors of other farm products to terms, too, but so far, except for encouraging farmers to hold soybeans last fall, it has used the device only with livestock.) Fresh meat being in relatively short supply at all times, with the consumers constantly eating their way into those supplies, the NFO strategists believe that concerted action by a large number of producers—and they would not have to be a majority—could make the processors scream "uncle."

So far three holding actions have been attempted. The first, on hogs only, was in the fall of 1959. It was centered on the St. Joseph, Missouri, market, lasted only five days and had very little effect.

"It was too easy for the market interests to get hogs from areas which had not yet been organized," Staley comments.

Organizational efforts were pushed all that winter and by the time the second holding action, again on hogs only, was called in the spring of 1960, fairly large areas of Missouri, Kansas, Nebraska, Iowa, and Illinois were in the NFO camp. The result again was decidedly less than spectacular, but the NFO leadership was far from discouraged. They wrote this off as a test and felt that it showed they had gained

strength during the months following their first attempt.

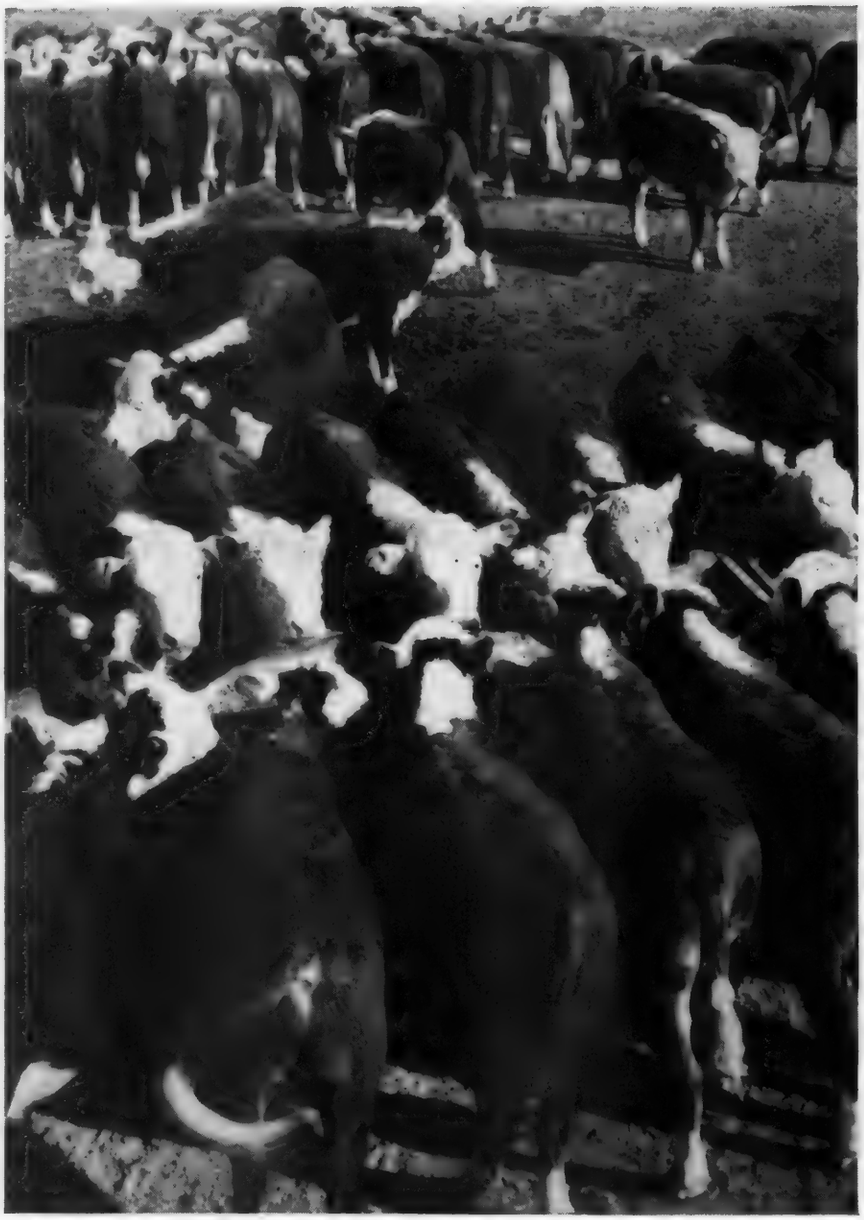
The third holding action started Easter Monday this year and lasted until April 18, a total of 12 marketing days. A price of $35.45 was asked for Choice steers, $22.75 for No. 1 and No. 2 hogs weighing from 190 to 210 pounds, and $29.45 for Choice wool lambs. Actual prices prevailing during the period were around $24.50 for the Choice steers, $17.00 for hogs and $16.00 for lambs. The action focused on markets at such widely scattered points as Chicago, South St. Paul, Evansville, Sioux City, Omaha, Kansas City, St. Joseph and East St. Louis. The NFO declared the results were most encouraging. The processors and market people denied it had any effect. No contracts were signed. Market receipts and prices remained at "normal" levels.

This is where the NFO charges dirty work. Receipts, they claim, were definitely restricted. Normalcy was maintained only

(*Continued on page* 151)

# HOW TO STEP-UP PROFITS FROM YOUR STOCKERS AND FEEDERS

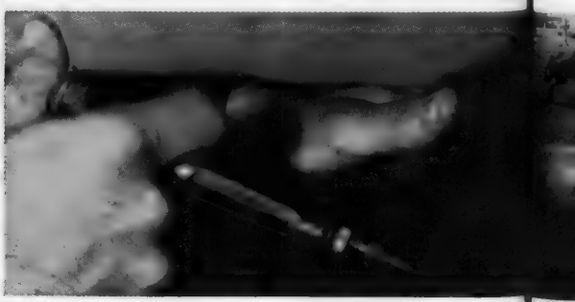
*This coordinated step-by-step program will help you market more cattle, with better bloom and quality at lower cost, to bring you higher returns*



**1. Good start important.** Put newly arrived calves on a good stress feed that provides 350 mg. of AUREOMYCIN per head per day, for up to 30 days, to prevent bacterial pneumonia, shipping fever, bacterial diarrhea, foot rot and secondary infections. Vaccinate with LEBAC® to prevent leptospirosis.

**2. Treat these diseases fast.** If you detect shipping fever, bacterial diarrhea or foot rot among the new arrivals, treat immediately. Use SULMET Drinking Water Solution in your stock tank to mass-treat an entire bunch; for individual animals use SULMET Intravenous or SULMET OBLETS®.

**4. They need more than good pasture.** Feed a pasture supplement that supplies 70 mg. of AUREOMYCIN per head per day to maintain weight gains and help prevent foot rot and respiratory infections. Treat pinkeye with AUREOMYCIN Powder or SULMET® Emulsion. Use malathion to control flies.



**6. Set up vaccinating program.** Schedule your vaccinations for infectious rhinotracheitis; for anthrax with CARBOZOO®; for leptospirosis with LEBAC®; for black leg, malignant edema and shipping fever with TRIBAC®; for red water disease with Clostridium Hemolyticum Bacterin.

When that good bunch of calves you carefully selected arrives, you want to bring them along at lowest cost and secure highest market returns.

That's why this Coordinated Feed-Health Program was developed —to give you improved weight gains and feed efficiency; closest possible control over the visible and invisible diseases that retard growth, run up feed costs and result in lower returns.

This easy-to-follow program dovetails the use of good formula feeds containing AUREOMYCIN® and the vaccines and medications that safeguard your cattle investment.

Read each step in the Coordinated Feed-Health Program and you will see that it gives you a commonsense timetable and procedure to follow throughout every stage of your stocker-feeder operation, from arrival to market. It is practical, easy to use and, combined with good management, *designed to help you make more money.*

Your veterinarian and feed man will be glad to discuss it with you. Your feed man also has a special folder which describes this program for you in much greater detail. It is yours free for the asking. If he has temporarily exhausted his supply, write direct to us for your free "Coordinated Feed-Health Stocker-Feeder Program." American Cyanamid Company, Agricultural Division, Princeton, New Jersey.

*•AUREOMYCIN is American Cyanamid Company's trademark for chlortetracycline.*

*The label instructions on Cyanamid products, and on products containing Cyanamid ingredients, are the result of years of research and have been accepted by Federal and/or State Governments. Always read the labels and carefully follow directions for use.*

CYANAMID

**COORDINATED FEED-HEALTH PROGRAM**

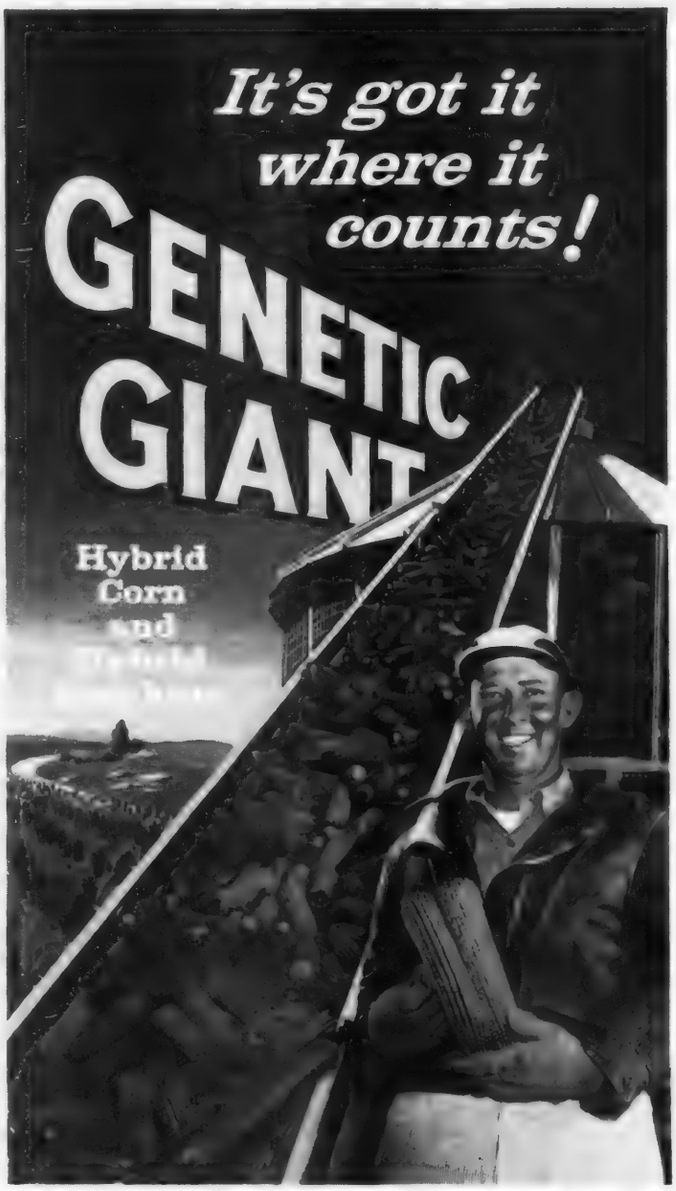
*CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE*

**3. Maintain good health through winter.** Maintaining economical growth and weight gains in your wintering stock depends on keeping them in good health and vigor. Use a wintering supplement that provides 70 mg. of AUREOMYCIN per head per day. If necessary, use a stress feed containing AUREOMYCIN.

**5. Give cow herd good feed supplement.** Help prevent disease in your stock cows and insure bigger, thriftier calves by using a supplement providing 70 mg. of AUREOMYCIN per head per day. To prevent anaplasmosis, use supplement that supplies 0.5 mg. of AUREOMYCIN per pound of body weight per day.

**7. For profitable weight gains in the feedlot.** Use a fattening supplement that supplies 70 mg. of AUREOMYCIN per head per day continuously. This will help prevent the diseases previously mentioned *plus* liver abscesses, and keep feed efficiency up, weight gains above average.

**8. Here's your feed-health program payoff.** This coordinated program will help you ship more cattle, with better bloom and quality at lower cost, to bring you higher returns. Follow this practical program, in cooperation with your veterinarian and feed man. *It will pay you well.*

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### REPORT FROM THAILAND

*(Continued from page 38)*

so big. Moving into the higher ground beyond, Thai farmers kept on trying to grow rice, rice, rice—on land ill adapted to upland rice and rarely irrigated well enough for wet rice. The problem was to show these sub-marginal rice farmers they would do better with cattle or corn or kenaf, or still other crops. The chief area for new development in farms was (and still is) the Northeast—a plateau ringed by low mountains, stretching away beyond the margins of the Chao Phya delta towards the Cambodian and Laos borders. This is the new frontier of the Thai economy.

Sam is one of the many Thai farmers who have benefited by the new Friendship Highway, but is more energetic and perceptive than most. Formerly he shipped his produce to Bangkok by rail—a two-day trip without refrigerator cars. Now there are buyers with trucks who come to his door—not only from Bangkok but from Korat and even from Laos. Sam makes a lot more money, with three hands to help him work his land intensively. He takes in (as he tells me) 10,000 baht on each rai each year—$500 U.S. from each half-acre, more or less. And 60 percent of that is profit. Call it $1800. For a family of three that is a good income, roughly six times the average in Thailand, which comes to about $100 per capita annually. Sam and his wife and small son live in modesty verging on penury, and put nearly all the profits back into a ranch farther upcountry—which is our real story.

Thailand's Northeast today is to them the equivalent of America's Northwest Territory in 1803, when Ohio was admitted to the Union. It is a place of hills, rolling plateau, mostly jungle but with some natural grassland. There's plenty of room for two or three times the 25 million people of Thailand if this kind of country is developed vigorously and wisely. Today 63 percent of Thailand is covered by forests, much of it scrub timber of no great value. Some of this is too mountainous, some too dry. A lot of it must be kept wooded for water conservation. But much of it can be made to produce foods and fabrics for human needs. But it *won't* grow paddy rice. Most of Thailand's farmers need help, to make the transition from their centuries-old tradition of growing wet rice and a few vegetables, with the help of their photogenic water buffaloes. In this rolling forest land, as in frontier America, a Thai farmer can homestead—if he has a frontiersman's spirit, as only a limited number of Thailanders have.

Sam, M. R. Parcharjakornvaravon, that is to say, took up a homestead of 10,000 rai (4500 acres), 60 miles back from the highway. It is free land, if he can work it. To visit his homestead the first time, Sam had to go on foot, for there was no road, no trail. It took him two days and a night. He borrowed an elephant; for elephants are wiser than men in certain respects, and instinctively find the best routes through jungle and tall grass.

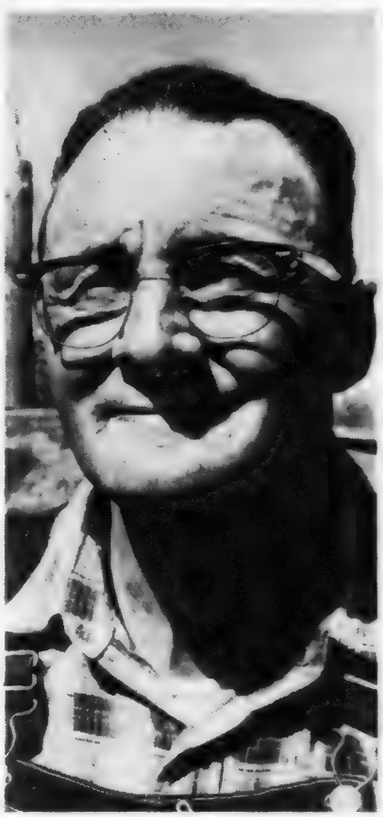
Later Sam persuaded a sawmill operator to follow him in, cutting timber and making a trail. Now he can get to his ranch by jeep. Sam also built a "house" on his homestead—using only a hammer, ax, saw, knife, and materials he could get from the jungle. He had in his mind all the details of the American frontier farmstead, in model form at the Smithsonian, and when in doubt he does whatever the early settlers of the U.S. Middle West did.

I ventured the hope that he would not be as prodigal as American frontier settlers were with natural resources. But Sam has the benefit of good advice from our agricultural experts at ICA. Besides, a man who can get five crops a year from his irrigated fifteen rai doesn't need advice on farm practice. Indeed, he is showing the ICA experts a few things, as one of them admitted to me wryly.

The homestead, as Sam envisions it, will be half cattle land and half cropland. He has about 100 head of cattle there now, using a Brahma bull (from an ICA shipment) and native cows to get strong, well-acclimated animals. Under the ICA farm programs, about 300 purebred cattle were imported for breeding, and through 1960 some 84 bulls were distributed to villages. This has paid off. In five years, export earnings from livestock and products returned far more than the total cost of ICA's entire technical aid program in agriculture.

Sam is not without troubles, however, on his homestead. They come especially from ticks and tigers. An observant young man, he

# "Our truck does double duty... and we save more than ever!"



**Irvin Schnurr, Medicine Lodge, Kansas, has joined the ranks of farmers who count on the Eaton 2-Speed Axle to cut costs and boost profits.** "A truck has to be a real workhorse when you run a 2400-acre farm like this," says Mr. Schnurr. "We need positive pulling power in the field, time-saving speed on the road, dependable performance day in and day out.

"Our Eaton 2-Speed Axle is the answer. In the field, Eaton's powerful low-gear range pulls us out of many a muddy spot. During harvesting, our truck maintains a steady crawl speed . . . keeps moving smoothly with the combine. On the road, Eaton's high-gear range really cuts hauling time . . . gets our hogs and cattle to market a lot faster, even with full-capacity loads!

"And here's the best part: we're saving plenty on gas . . . and it's a long, long time between repair jobs. Because the Eaton 2-Speed keeps engine RPM down, there's less strain on all power transmitting parts . . . less fuel consumed. It's as simple as that."

**GMC Dealer J. R. Willcut, Asst. Sales Mgr., Sauder-Lygrisse, Inc., Wichita, Kansas,** says, "We always recommend the Eaton 2-Speed Axle . . . but more often than not, farmers ask us for it. They know that in addition to all the working advantages the Eaton gives them, they can expect a higher trade-in, too."

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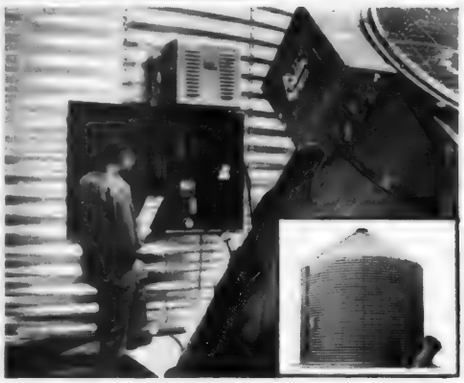
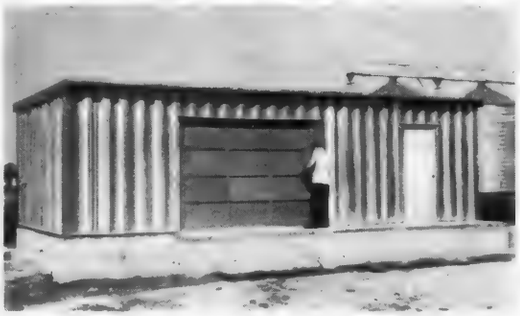
MONTHLY PHOTO REPORT

# NEWEST DEVELOPMENTS for Progressive Farms



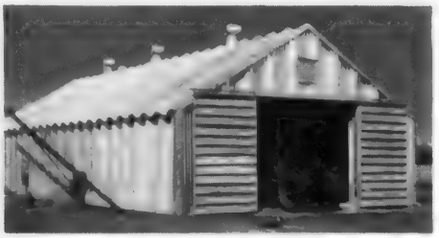
**Natural Air Drying Tank Dries 4 Ways.** Farmer at control of in-storage drying tank can dry with natural air, supplemental heat, constant heat or batch dry up to 1000 bu. at one time. Dry under any conditions. Special slide rule computes drying time, rate of air flow, expected final moisture content, etc. Tank complete with grain leveler; 5 roof outlets, 2 ladders; unloading tube; static pressure gauge; humidity gauge. Unloading equipment optional. Factory pre-wired electrical system eliminates on-job wiring. Size: 1,700-10,000 bu. *Behlen Mfg. Co., Columbus, Nebr.*

**Sealed eave** featured in new grain tanks by *Behlen Mfg. Co., Columbus, Nebr.* Roof panels are formed to bolt directly onto sidewalls. Provides a rigid and grain-tight eave connection. Allows fumigation without tape-up. Steep-pitch roof fills to peak without hand leveling for bonus storage. Sizes: 950-15,000 bu. including four new 22′ diameter models.

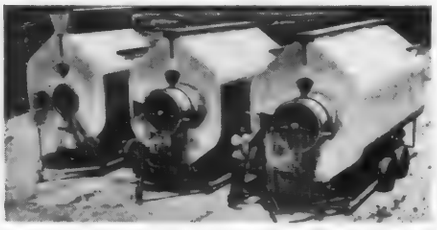


**No Frame to Build.** Just bolt together heavy-gauge, 3″ corrugated steel panels to erect this building. For farm or town. Use as garage, milking parlor, repair shop, meeting hall, etc. Comes in 35′ x 20′ units with choice of 10′ or 14′ wall heights. Combine units to form building of any length. Door, window selection. Expandable. *Behlen Mfg. Co., Columbus, Nebr.*

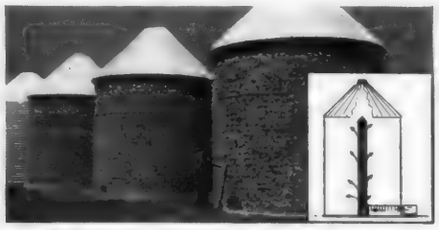
**Expandable Multi-Purpose Building.** All-steel Curvet of *Behlen Mfg. Co., Columbus, Nebr.*, designed for expansion to any length. Two utility models for machinery, tool shop, other uses, in 40′ and 53′ widths. Special 40′-wide grain storage model, with reinforced walls can store grain without tie rods. With drying floor, automatic unloading.



**Frameless Straightwall Building** gives clear interior for warehousing, implements, tool shop. Also stores grain 12′ high against sidewalls. Steel partitions available to separate grain and utility areas. Two steel models, grain storage with 30° pitch roof. Utility building with 16° roof. 39′ and 52′ widths. *Behlen Mfg. Co., Columbus, Nebr.*



**Three Models of Grain Dryers,** 270, 375, 500-bu. capacities, are batch-type, portable. Can keep ahead of harvest crews, dry a 500-bu. batch of 30% corn in 2½ hours. Burn LP or natural gas. Operate off PTO or electricity. Also 750-bu. size. *Behlen Mfg. Co., Columbus, Nebr.*



**Rust is "Outlawed"** from these "Steep Pitch" Roof corn cribs of *Behlen Mfg. Co., Columbus, Nebr.* Heavy #2 gauge bar mesh steel, galvanized after welding with up to 6 times normal rust-preventing zinc. Fill to peak, no hand leveling. Sizes: 611-1940 bu. Natural air drying system.

saw chickens eating the ticks from cattle; so he brought a few hundred chickens to his ranch to keep the ticks under control, saving the cost of chemical treatments. But the tigers were not so easily subdued. Sam has killed two, and believes he has two more in the neighborhood to deal with. His eyes light up with a mild fury when he talks of tigers because one of them got a Brahma bull, a major loss.

Sam is able to drive his steers to the highway in two days' time, and then moves them to market by truck. Before the new road was built, cattle had to be shipped by rail, on a slow schedule, with a lot of shrink on the way. For Sam, and for hundreds of other Thai farmers, Friendship Highway is paying off—quite aside from the military value of a good road up to the Mekong and the free-world frontier.

It is true some Thai politicians bought land at advantageous prices along the route of this highway, once its location was known to them and not yet to others. They are improperly enriched, no doubt. But with rare exceptions, they are developing the land, not merely speculating; so the Northeast *is* being opened up.

All this might seem enough to absorb the energies of our friend Sam. But it is not so. He led the way in organizing, and is now president of the Pakchong Farmers' Cooperative. It started in 1960 with 69 members, now has 294, and has more in prospect. Sam is young, 31 years old—the "baby of the co-op," as he says with a quick smile. But he's bright and full of ideas as well as energy. And he has the M.R. of royal lineage in front of his name—which does no harm in a country deeply committed to monarchy and respectful of status.

The Pakchong co-op has not yet gone into cooperative buying or even marketing, but eventually will. Meantime, it is Thailand's pioneer credit co-op, launched at the urging of ICA by the Thai government with some counterpart funds to get it going. (Counterpart funds, in the local currency, are generated when the U.S. government sells surplus farm products under PL 480 to the Thai government or other agency there.) The Pakchong co-op will be the pattern for a network of such co-ops, to be financed by an agricultural credit bank with backing from the International Bank.

But already the farmers around Pakchong are borrowing for valid productive purposes at one percent a month, and are maintaining a record of 95 percent collections on loans. Dividends from the earnings of the co-op are paid to members in additional shares, to enlarge the working capital. If one percent a month sounds high, remember that the traditional source of farm credit in Thailand has been the Chinese moneylender who has charged five percent a month, or from 25 to 100 percent per year.

With efficient, rapid transport to markets by the new highway, and with credit at tolerable rates, the farmers in this part of the Thai Northeast are getting over the subsistence hump, to grow corn, peanuts,

WEIGHT → FORTUNE→

**63.7 LBS. MORE PAY WEIGHT...FROM PASTURE TO FEED LOT TO STOCK YARDS!**

**$7.00 EXTRA PROFIT FOR EVERY DOLLAR INVESTED IN MORTON T-M SALT!**

Here are the vital facts about the extra gain you can get with Morton T-M Salt . . . as proved by a long-term test conducted by Kansas State University:

*During a 549-day continuous test covering four feeding periods—pasture; winter; pasture; and finishing—cattle fed Morton Trace-Mineralized Salt free-choice gained an average of 63.7 lbs. more pay weight per head than cattle fed plain salt. Figuring the cost of this gain against the extra cost of feeding Morton T-M Salt and a conservative selling price per cwt. . . . the feeder got back more than $7 for every $1 he invested!*

And so the evidence mounts up. Morton Trace-Mineralized Salt has a valuable role to play in your feeding program. Even if you use other minerals, Morton T-M Salt increases feed efficiency so that all other feeds do a better job. Your animals stay healthier and gain faster when they get Morton's exclusive formulation of essential trace minerals in their salt every day.

Be sure to feed Morton T-M (Trace-Mineralized) Salt, free choice, to your beef cattle, dairy cows, sheep and hogs . . . to all your livestock. At your feed dealer's, in bags, blocks and bricks. **Morton Salt Company • Chicago 6, Illinois.**

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soybeans and other cash crops—the corn mainly for export to Japan. Scattered through the Northeast plateau are 500 deep wells, another U.S. aid project. These wells not only confirm an abundance of underground water, but provide the first uncontaminated water that thousands of Thai farmers have had. In addition there are many new storage dams on narrow valleys. There, water is impounded during the torrential rains of the two rainy seasons and fed down through irrigation ditches to farms below. This opens some new land and makes possible two cereal crops a year on land that formerly gave but one.

Water is the crucial agricultural problem in enormous areas of the world. In some countries, like northern Kenya, there's never enough rainfall. In some, like many scattered areas of the tropics, there's too much water. In Thailand, and most countries with a monsoon climate, the trouble is a rainy season and then drouth for months on end. For these countries water storage can work wonders, checking erosion and stretching the growing season.

The U.S. economic and technical aid program for relatively well-off Thailand is quite properly small—$25-million a year for a country with a population of 25 million.

Over the past decade, U.S. aid to Thailand (aside from military aid) has been divided as follows:

| | *millions* |
|---|---|
| Transport, mostly highways and bridges | $51.5 |
| Power and industry (mostly power) | 12.7 |
| Health and sanitation | 12.3 |
| Agriculture | 11.5 |
| Education | 10.5 |
| Public administration | 5.5 |
| Other (mostly surveys, advisory jobs) | 5.0 |
| | $109.0 |

The $11.5 million for agriculture has been spread over a wide range of projects. To that sum, $12.5 million in counterpart Thai currency was added. And the Thai government put in the equivalent of $10.7 million. So in reality about $35 million was spent for agricultural projects in Thailand within the ICA programs. These range from irrigation and water conservation (more than a hundred water storage reservoirs, for example) to a comprehensive scheme to improve agricultural statistics. Next to water conservation, the largest outlay was for agronomic development. This included the testing of 200,000 varieties and samples of rice, to improve varieties and yields; and experimentation with rotation and green manure on wet rice lands.

One of the most gratifying agronomic programs has been finding suitable upland crops for new lands upcountry, like our friend Sam's. Corn is the brightest example. By the introduction of Guatemalan corn

(*Continued on page* 105)


Tired of working yourself to death and still not getting ahead?

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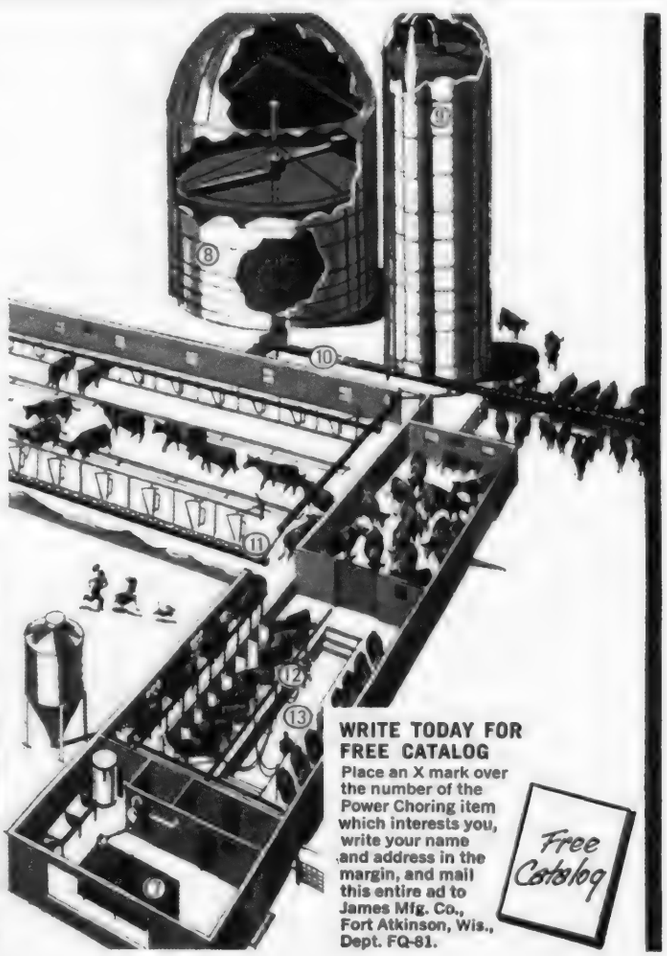

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# *NOW! the Perfect Farm Plane at a Practical Price*

## NEW LOW-COST PIPER Colt 108

### FIRST "COMPACT OF THE AIR" with amazing flying ease and safety...120 mph speed ...18 miles per gallon economy.

**NOW** for a third less than the price of any other suitable farm plane, Piper presents the brand new Piper Colt 108—as useful as a Jeep, as economical as a compact, as easy to fly as driving your car . . . . and safe as can be.

Here's just the plane to find out for yourself how easy and pleasant it is to fly, how useful a plane can be, and *how economical!* . . . . better than 18 miles per gallon at 115 mph straight-as-the-crow-flies cruising speed.

Trips become so fast and simple . . . trips to the city, to cattle sales, to visit friends and relatives, to get urgently needed machinery parts, saving you time you can best use otherwise, and giving you *at the same time* a satisfying recreation that any hard working man needs and deserves.

How about a new Piper Colt in your stable?

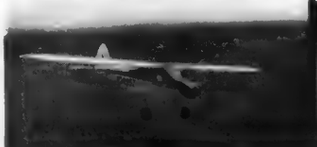
### PIPER ALSO OFFERS THESE OTHER FINE PLANES FOR FARM AND RANCH

AZTEC. Carries 5 people at over 200 mph. Up to 1400-mile range. Operates well out of short, rough fields.

APACHE. Most popular, most economical twin-engine plane. Cruises 170 mph; carries 4 or 5 passengers.

COMANCHE. Fast, roomy 4-place; holds 3 world distance records. Cruises 181 mph with 250 hp; 160 mph with 180 hp.

CHEROKEE. Newest, roomiest, most advanced low-cost 4-place plane. Cruises over 130 mph, very simple to fly.



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PAWNEE. World's widest-selling duster/sprayer. Carries 800-pound chemical load. Very economical; very efficient.

### THE PERFECT PICK-UP

The Colt can carry over 400 pounds of cargo plus pilot and fuel, with lots of space to load it.

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Any level or slightly sloping strip 1500 feet long and 50 to 100 feet wide makes a good, safe "airport" for the Colt.

### LEARN *FREE* WHEN YOU BUY

Your Piper Colt dealer will teach you to fly FREE when you buy your Colt. See him today or write for full details.

### NOW! SPECIAL FARM PURCHASE PLAN

with quarterly or semi-annual payments, as well as lease programs can be arranged by your Piper dealer.

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MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

## How to

# Keep Anaplasmosis from Crippling your Herd

**Cattlemen are losing $9.5 million per year from it**

**Herds in 40 states have already been hit...and it's still spreading**

**Get your veterinarian's help before acute cases show up**

**Here's a program to help curb these staggering losses**

## What is Anaplasmosis?

Anaplasmosis is a complicated disease that for many years was found mainly in the South and Southwestern states. Recently, however, it has been spreading until cases have been reported in 40 states.

The primary effect is a lowering of red blood cells—leading to acute anemia and death. Death losses as high as 50 percent have been reported in outbreaks.

Blood tests are essential because symptoms of anaplasmosis at various stages may be confused with anthrax, pneumonia, leptospirosis, malignant edema and poisoning or digestive troubles.

And because the acute stages of anaplasmosis come on in the summer, now is the time to work out a control program.

**1. Work with your veterinarian.** Anaplasmosis requires veterinary diagnostic aid and treatment to be stopped effectively. Prevention or control of outbreaks in your herd makes it desirable to set up a control program with your veterinarian *for your herd, your farm or ranch and your area.* The summer months are particularly dangerous, for this is when specific outbreaks occur.

**2. Use the best management you know how.** Flies, ticks, mosquitoes and other biting and blood-sucking insects spread anaplasmosis. A good spray and dipping program, especially during the summer months, can go a long way in checking the insect problem.

Make sure dehorning, castrating, and vaccinating equipment are kept clean; dirty or contaminated instruments can spread the disease from infected animals.

**3. Test for carrier animals.** Cattle that have recovered can probably spread anaplasmosis the rest of their lives; the same is true of sheep and other ruminants like deer, elk and antelope.

Your veterinarian can test for carrier animals now in your herd or before you bring cattle onto your place. If your area so far is anaplasmosis-free, you may not want to bring carrier animals to your farm or ranch. In any case, isolate carrier animals from non-reactors, if possible.

**4. Protect cattle against outbreaks.** During the summer months a preventive program can give you protection against clinical outbreaks. Your veterinarian can recommend the best program for you.

**5. Fight advanced cases fast.** One sign of a clinical case of anaplasmosis is yellow coloring of the udder, vulva and eyes. If your veterinarian does diagnose an acute case of anaplasmosis, he'll probably prescribe a

broad-spectrum antibiotic, such as Liquamycin* Injectable. Fast action is essential, to prevent death losses and to speed recovery.

In any case, the best control is prevention—that's why it's a good idea to talk to your veterinarian now—to stop any of that $9.5 million losses from coming out of *your* pocket.

**Brand of oxytetracycline HCl—Reg. U. S. Pat. Off.*

## More valuable information on Anaplasmosis

(33⅓ R.P.M.)

To give you an even better understanding of this dangerous disease, a free 7" record is available—recorded by an outstanding practitioner of veterinary medicine with years of field experience on anaplasmosis.

Also available in reprint form. Write to the address below. State whether you want the free record or reprint.

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*Science for the world's well-being®*

Mayflower's L. Duchess from Urbana, Ohio

# New World Champion Jr. 4-Year Old Guernsey Produces 21,392 lbs. of Milk on Red Rose Feed

Meet the new World Champion Jr. 4-Year Old Guernsey milk producer. She's Mayflower's L. Duchess of Mayflower Farm, Route #3, Urbana, Ohio, owned by Jack C. Foust and Donald Barger.

L. Duchess made 21,392 lbs. of milk and 901 lbs. of fat in 305 days on 2 x H.I.R. test. She averaged 70.0 lbs. of milk per day and sold over $800.00 worth of milk during the 305 days.

"L. Duchess made her record on Red Rose 14 Test-Cow Feed," say owners Foust and Barger.

"We fed her 23 lbs. of Red Rose 14 Test-Cow per day and good hay. She held her body weight all through the hot weather. Red Rose 14 Test-Cow is better than any feed we have ever used. It kept her appetite from lagging, and she also maintained production during the warm summer months when production ordinarily drops.

"We increased Duchess' production by 7,069 lbs. and 227 lbs. of fat over her last lactation on Red Rose 14 Test-Cow."

Now, this record-producing Red Rose 14 Test-Cow Feed has been improved upon. It has been completely reformulated and developed into a new, universal dairy feed.

If you are interested in increasing the production of your dairy herd, ask your Red Rose dealer about the complete Red Rose Dairy Program. Or, write Red Rose direct for a special Red Rose Feeding Program recommended especially for your herd.

RED ROSE
FARM FEEDS
JOHN W. Eshelman & SONS
ESTABLISHED 1842
LANCASTER PA. • YORK PA. • CIRCLEVILLE, OHIO
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*Distributors from Maine to Florida, Ohio to the Atlantic*

and Hawaiian sugar corn and pretty energetic promotion of corn as a new idea for Thai farmers, production of corn was raised by 1957 to a record of 136,800 tons. Yields have been increased by 40 percent and total production tripled in six years. There's a ready export market for Thailand's newfound corn surplus in Japan (where prosperity plus American influence has put meat into the national diet and created a demand for stock feed.)

Here in Bangkok, just now at least, Thai leaders are much more concerned with the Laos frontier than with the economic frontier in the jungle-covered plateau of the Northeast. They would welcome a more determined policy than President John F. Kennedy and the military staff of SEATO have provided up to now. But they cannot move on their own, for Thai forces, 3½ divisions, would be no match for the 15 to 18 divisions of North Vietnam, not to mention Communist China.

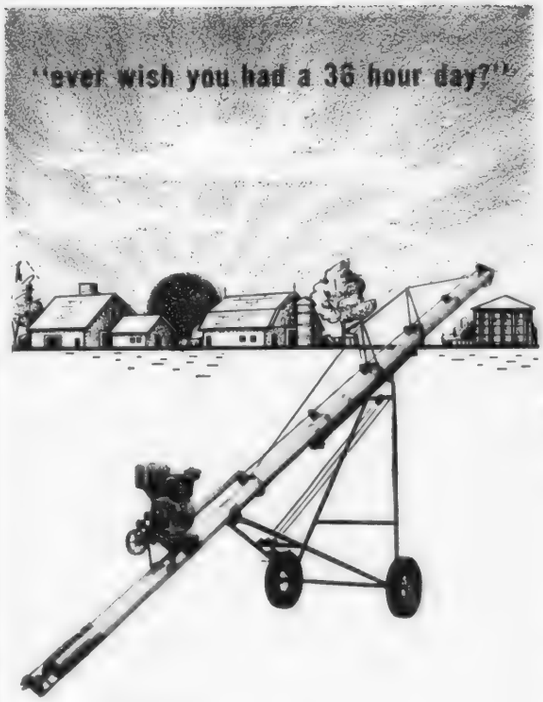
But who is to say which frontier will loom the larger when the benefits of the Thai-U.S. Friendship Highway are totted up a few years from now? This road will allow the swift movements of troops and supplies north and east from this staging point to the most critical stretch of the free-world frontier, on the Mekong facing southern Laos. Irrespective of this, however, the opening of a great untapped reserve of farmland will solve a less dramatic internal problem for Thailand in coming years. The hot, dusty, jarring, ten-hour trip from Bangkok to Korat is being cut to a three-hour ride in comparative comfort. This alone is changing the face of the Northeast country, the character of its agriculture, the level of living and the export pattern of the country.

Like most persons who have seen U.S. overseas aid at many points on the receiving end, I can become pretty cynical about it at times. There is the military hardware that winds up being used against us. There is the black market in U. S. military goods. There is the outright payment and feeding of troops in some countries that may or may not fight on our side in the showdown. But the use I have seen made here in Thailand of U. S. tax dollars is heartening.

M. R. Parcharjakornvaravon, known in New Jersey as Sam, is, of course, exceptional. He happens to be the kind who would have done well taking a wife and young son down the Ohio on a flatboat in 1790. In the Thai Northeast he has some advantages, to be sure. He is a child of ICA in several ways. The new road makes his truck farm much more profitable. The Brahma bulls brought to Thailand with U.S. dollars give him superior cattle. The co-op over which he presides was formed with counterpart funds.

But Sam puts in far more than he takes out. He works his own land, builds his own houses, cuts his own trails, hires his own elephants, and kills his own tigers. And why not? Sam learned about frontier life—of all places—at the Smithsonian Institution.

THE AUTHOR: William H. Hessler is foreign news analyst for the Cincinnati *Enquirer*. In national magazines his articles most often deal with international affairs and naval defense.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Try doing a normal 36-hour loading job in just one day with this new seven-inch auger. Move up to higher capacity and mechanical dependability. The Cardinal "Big 7" moves more load in less time and saves you that much more money. Use it as a stationary or transport unit. It's a big step toward complete "farmstead mechanization".

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Whatever your conveying need may be, you'll find it in the Cardinal Line. It's complete for modern farm needs. Thousands of satisfied users on American farms prove Cardinal economy and long life.

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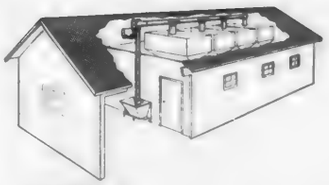

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Auger systems for feed and grain handling. 4 and 6-inch diameters—extendable lengths. Wide range of accessories and assembly parts.

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Both aluminum and galvanized single-chain models. High capacity. Quality plus—Timken Bearings and self-cleaning drive sprocket.

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Low cost yet rugged and efficient. Versatile to suit most elevating requirements. 16-gauge steel construction.

CARDINAL SKIPPER 20
Assures proven dependable performance and economy. Heavy duty, double chain elevator. Lengths to 46', trough 20" wide.

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The original sectionally-constructed bale conveyor—a proven success. In demand for mow use. Moves up to 600 bales per hour.

For better "Farmstead Mechanization", consider these important factors before choosing your next conveyor . . . the size of your farm, the type of grain and feed you will handle and the capacity of your equipment. Your Cardinal Dealer is well qualified to recommend the right Cardinal Conveyor to fit your specific work-load and budget requirements.

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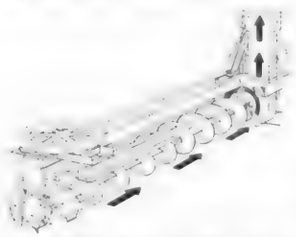
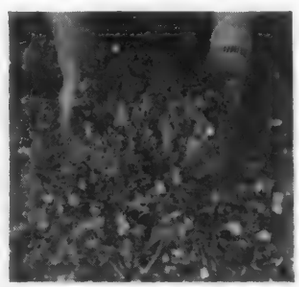
"MY Brillion
SILO UNLOADER
DOES EVERYTHING
THEY SAID IT WOULD
—AND MORE!"
Self adjusting spout—rigid and trouble free. Automatically adjusts to silo door openings as height of silage changes.
Telescoping torque arm—adjusts spout automatically. Unloads silage to the depth of two silo doors without your climbing into the silo.
Balance weight maintains proper machine balance for level, uniform cut
Shielded auger assures maximum flow of silage to the open bottom blower. No blocking or clogging. No freezing in below-zero weather.
Dismantles into smaller, lighter sections for easy transfer from one silo to another. Adaptable to different diameter silos.

**WALL CLEANER**—Takes out frozen silage clean as a whistle. Never digs into doors. Big 9 inch auger has heavy 2 inch shaft.



**DIRECT FEED**—Only the Brillion augers silage straight into blower . . . no loss of capacity and power, a big advantage.



**BETTER SILAGE** — Silage is fresh — no frozen or spoiled lumps—reduces waste and digestive troubles. Cattle love it.

Owners of Brillion Silo Unloaders—to a man—are outspoken in praise of their Brillions. When you talk to an owner, he'll invariably mention four things: (1) ". . . really takes out frozen silage," (2) ". . . rugged construction," (3) ". . . pours down silage in a hurry," (4) "Suspended . . . and by a single cable."

But this is just the beginning.

You'll find that Brillion Unloaders have more of the features on your want-list than any other unloader. (Surveys of silo unloader owners show that of the ten most-wanted features in an unloader, only Brillion has all ten.)

**BRILLION IRON WORKS, INC.**

Brillion, Wisconsin, Dept. SU-3-8

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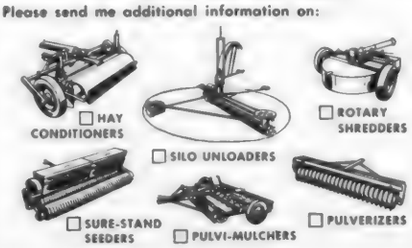

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(Write name and address on margin.) ☐ I am a student


## GRADED CATTLE DRAW THE BUYERS

(*Continued from page* 59)

ordinating activities. Screening committees, made up of the county agent and two producers in each county, inspect all the offerings before they go to the sales. In most cases this means inspecting only offerings from new consignors. After a producer has consigned once or twice he has a good idea of what is wanted and what will be rejected. No calves or yearlings below Medium grade are accepted.

The State Department of Agriculture furnishes the graders and a veterinarian.

Completing the organizational staff are extension specialists from Virginia Polytechnic Institute. K. C. Williamson is the present coordinator. A tall, long-striding, young successor to the founder of this sales series, his deep-set dark eyes can spot a buyer in the most remote corners of the arena. Allen K. Randolph, secretary of the Virginia Beef Cattlemen's Association, and Martin Strate, fieldman for the association, handle much of the pre-sale organization, and work the ring during the sales. Strate at times relieves the auctioneer.

One of the secrets of the success of the Virginia sales is their chronological and geographical arrangement. Buyers can follow the circuit from one sale to the next in most cases. Sales are held, for example, at Orange, Charlottesville, Culpeper, and Staunton on succeeding afternoons. The following week the buyers move to another area where another group of sales follows in quick succession.

Only calves and yearlings are offered. The calves are both steers and heifers; the yearlings, mostly steers. All are sired by registered beef type bulls and are out of high-grade commercial cows. Consignments of calves are accepted only from producers.

Each calf or yearling is individually tagged, weighed and graded on arrival at the market. This takes 14 to 16 hours for the larger sales. The graders usually work in pairs and they must personally mark each animal. With paint bucket and marking iron in hand they size up the calf and make a quick, accurate appraisal of its quality. The Fancy ones get an "AA" on the back; the Choice are marked "A," the Goods are marked "G"; and the Mediums get a line on the shoulder.

After grading and weighing, the cattle are cut into pens according to breed, weight, grade and sex. The weight breaks are in 50-pound intervals, 300 to 350 pounds, for example, and so on up to 600 pounds for the calves. The lightest yearlings are 500 pounds, the heaviest 1,000 pounds.

After sorting, sale schedules are made up and mimeographed or printed for distribution to the buyers.

Lots of 20 or more are split at the discretion of the buyer who then must take at least 10 out of the lot. Thus, if a lot of 25 head is offered, the high bidder can elect to take the whole lot or he can take 10, 11, 15, just so he leaves at least 10 in the ring to be

Main photograph courtesy
The Caterpillar Tractor Company

# Portable Lincoln Welder saves thousands of dollars in crops

Harvest time is the worst time for breakdowns. And when they occur, the delays they cause can mean the difference between profit and loss. You can keep these downtime losses to a minimum with Lincoln gas-driven welders. Mounted on the back of your pick-up truck, you can take these welders right to the field where the breakdown occurred, repair it then and there, and get back to harvesting—fast. What's more, you avoid that extra costly delay of dismantling the machine, removing the broken part, and taking it to your shop or to town for repairs. Save harvest-time losses. Lincoln gasoline engine welders available from $535 up. P.T.O. welders from $220. Write for information or see your Lincoln dealer.

**CLIP THIS COUPON AND MAIL TODAY!**

Mail to:
**The Lincoln Electric Company**
**Dept. 3631**
**Cleveland 17, Ohio**

- ☐ Please send me information on Lincoln gas-driven welders.
- ☐ Please send me information on P.T.O. driven welders.
- ☐ Please send me name of nearest Lincoln dealer.

Name_____

Street & No._____

P.O. Box # or R.F.D. #_____

City_____ State_____

LINCOLN WELDERS

**THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT AND ELECTRODES**

700 hogs are housed in this RILCO Type 50 one-story barn on the Chapin farm, Norwalk, Ohio

Howard T. Chapin
Norwalk, Ohio

**"I like the freedom from obstruction in my RILCO barn!"**

"I can drive right in and clean out my barn with a moldboard on the front of my tractor," says Mr. Chapin. Post-free Rilco buildings are easier to work in—accommodate a full range of labor-saving power equipment.

Rilco rafters offer the rugged strength of selected kiln-dried lumber permanently bonded with waterproof glues. Rafters are accurately cut to length drilled for connectors . . . ready for fast erection to save you construction costs. Mail the coupon today for full information.

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**49 Auctions run Sept. 6th - Nov. 10th**

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**Keene, Va.**

reoffered. Division of cattle in a lot is made from the office records, the first buyer getting the first calves on the sheet, and so on.

Buyers, as at any livestock auction, can inspect the consignments in the yards before they go to the ring.

All staggy steers are rejected, as are also calves which have not been dehorned, cripples, and cattle which arrive lame or down in the truck. Pink eye and blindness also disqualify for the sales.

At most of the sales heifers are guaranteed open. The guarantee protects only the first purchaser and stipulates that the consignor of any heifer in the sale will reimburse the purchaser 20 percent of the purchase price. Claims must be filed within eight months. The claim must be accompanied by a certificate from a veterinarian or a county agent.

These claims are submitted to the secretary of the sale, but payment is made by the individual consignor. "That twenty-dollar bill is a good reminder to the producer to keep that bull out of the pasture," K. C. Williamson says.

Claims under the guarantees are few and are paid promptly. Chimabi Ranch, at Whittemore, Michigan, bought some 700 head last fall. "We filed claim for only five bred heifers," Hugh Henderson, president and general manager of the ranch, said this spring. "Over half our purchases were heifers. That shows what a small percentage of bred heifers sneak by."

Each of the sales operates under a definite health plan. At some sales all the calves must be from herds which have had a negative test for TB and Bang's disease within 12 months of the sale date. At others this requirement applies only to the heifers. Still other sales require that all heifers, even from tested herds, must be vaccinated with Strain 19.

The services offered by these annual feeder sales cost the producers between $2.75 and $4.00 per head. The market gets its regular commission of $1 per head plus one percent. Beside this, there is a 50-cent fee for the Virginia Beef Cattlemen's Association, 50 cents for the local association and a 20-cent grading fee.

The Virginia association uses a large part of its fees for promotion. Most of the advertising is by direct mail; notices and reminders are sent to old customers and new prospects as the sales approach. Ads in various state journals and local papers throughout the principal buying area, Virginia, Pennsylvania, Ohio, Michigan and Indiana, also help to draw buyers. Sixty-five percent of the offerings move out of the state.

Farm tours are another helpful public relations move. Groups of sales consignors, county agents, sales officials and graders visit the feedlots of the buyers of the previous season to see how the cattle are doing and how they are holding or improving their grade. The consignors get a better idea of the needs of their customers, while the buyers are left with the feeling that these are pretty good people to do business with.

Shrink seems to be a point of irritation touched on frequently by buyers. All cattle are weighed on arrival at the market, and a half day or more may elapse before they are sold. This can lead to heavy shrinkage between weighing and selling. The sales committees have been working diligently to solve this problem.

Most buyers seem well satisfied with the grading. "The overall program is second to none and their grading is excellent," Eldon Mount, manager of Schearbrook Farms, Trotwood, Ohio, said this spring as he prepared to welcome a group of Virginia producers on a tour. Mount also was favorably impressed with the precision and speed of the sales. A sale of 1,000 head seldom takes longer than an hour and a half to two hours.

The savings on shipping costs is another big factor with the buyers. Most Ohio, Indiana and Michigan buyers have a maximum haul of 600 miles; for many it is within 400 miles. This makes a nice saving in time and money compared with the 800 to 1,200 miles they would have to go westward for comparable cattle.

Then there is the comfortable feeling of a lot of the patrons of the Virginia sales. As one contented buyer put it as he left the Petersburg sale last fall, "You don't have to be an expert to get good cattle."

# A INVESTMENT IN FARMING'S TOMORROW

On January 1, 1961, Monsanto Chemical Company committed an important part of its facilities to a long-range agricultural program. On this date the new Monsanto Agricultural Chemicals Division officially began its operations.

This new division begins with an initial multimillion-dollar investment in existing agricultural chemical plants throughout the United States. These plants make Monsanto the largest single producer of prilled ammonium nitrate fertilizer, and these same facilities have already made important contributions to livestock and poultry nutrition, and to the control of noxious weeds and grasses, brush, and insects. (Randox,® Randox T, Urea, Tri-Una-Sol,* MHA,® Santoquin,® 2, 4-D, 2, 4, 5-T, Parathion, Avadex.®)

Behind this vast production stands one of the world's greatest research organizations.

But such vital statistics, important and impressive as they are, do not reveal the true importance of Monsanto's decision to step squarely onto the farm.

After careful analysis, Monsanto deliberately has turned counter to a current trend . . . a trend *away* from agricultural research by private industry. Monsanto is affirming its faith in the long-range future of agriculture by committing a significant portion of its manpower and production facilities to agriculture *at a time when many others are withdrawing or curtailing their activities in this area.*

True, the farmer is beset with many difficulties. True, the cost of agricultural research is rising at an alarming rate. True, competition grows keener by the year. But, these factors are an irresistible challenge to the many at Monsanto whose minds and hearts are wrapped up in agriculture. These problems *will* be solved eventually because agriculture is mankind's most essential business, and will be so long as there are men and women needing food and fiber.

Discovering new agricultural chemicals will not be enough. Designing plants and making the products will not be enough. Only when these products are channeled into your hands, at a reasonable cost... and only after you have been shown how to use them profitably . . . will the objective of this new Agricultural Chemicals Division be fulfilled.

Obviously, Monsanto expects benefits for the company and its thousands of stockholders. It would not stay long in business otherwise. However, you too must benefit in order for Monsanto to stay in business.

In short, Monsanto is now committed and dedicated to a program of *mutual* benefit with farmers. We intend to make the association a lasting one!

*T. M., M. C. C.

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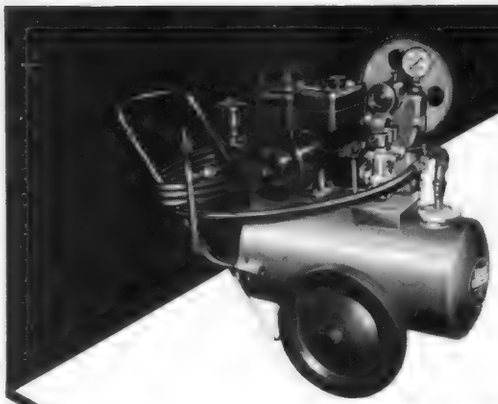

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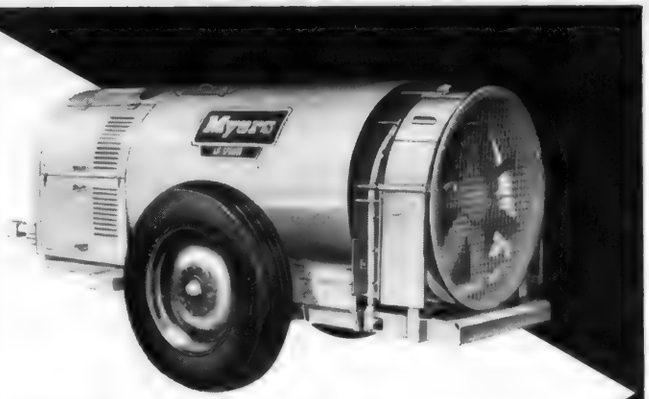


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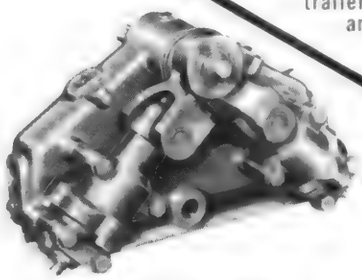

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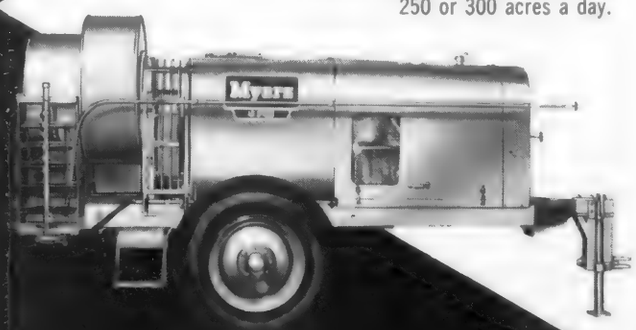


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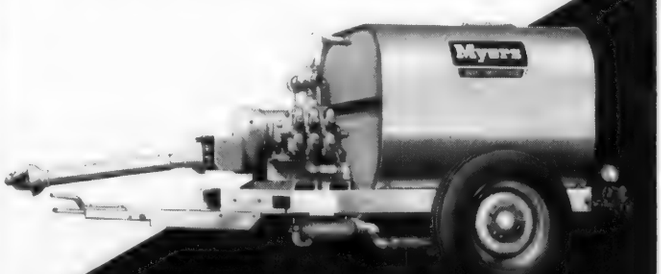


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## THIS CO-OP FOR THE BIRDS

(*Continued from page* 86)

In appearance, this strange bird is robin-size, about 10 inches in length, has a glossy black back with a conspicuous white rump and white wing patches that show in flight.

These birds do, mainly with their beaks, what man or most four-legged animals would do with their hands or forelegs. They collect, carry and stow away nuts, peck away wood, crack open acorns and nuts, and hammer acorns in beak-made holes for a tight fit. Their beaks must be rugged. Drilling in hard wood is as much brute force as it is industrial art and skill.

The early Spanish travelers to the Monterey Bay area in the late 1700's first described this bird and called him "El Carpintero" because of his woodworking habits. And taxonomist Robert Ridgway selected the name *Balanosphyra,* which means hammering acorns.

The second name, *formicivorus,* given this bird by Ridgway in 1881—meaning ant-eating—is now declared a thorough misnomer by modern ornithologists. They say this bird eats very few ants. They also claim that these acorn treasure houses are not worm hatcheries and pastures as was formerly supposed.

### Livestock Raiser?

And thus is raised one of the most hotly debated subjects between the country folks, amateur bird watchers, and the modern scientist. Does the woodpecker place his acorns to attract insects which will lay their eggs in the nut and so provide the birds with a crop of larvae? The amateurs will defend this theory with passion and will show the wormy acorns as proof positive. Science, in recent years, has changed its position on this subject. A research scientist by the name of Bice reported in 1878 that it was his opinion acorns were stored for the larvae which would grow in them. Encyclopaedia Britannica, as late as 1956, reported the birds raised their own livestock in this fashion. Today's scientists disagree.

By examination of the gastric contents of the California woodpecker in 1928, researchers found that during the fall months these birds ate almost 99 percent of the mast of the acorn. During the spring and into late summer they found the craw to contain as high as 15 percent insects including beetles, grasshoppers and ants, but no larvae.

It seems apparent from this examination the bird does not go after the larvae that develop in the acorn. Many acorns do become infested, but these represent a complete loss to the bird.

One other fact that distinguishes the Redheaded California woodpecker from the other woodpecker species is that he does not secure much, if any, of his food by drilling with his beak. The Redhead is bright enough to catch most of the insects it eats on the wing. He has a characteristic flight, ascending at acute angles, almost vertically,


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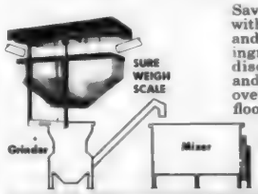


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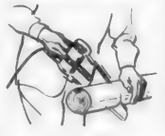

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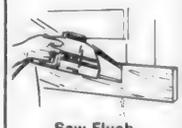

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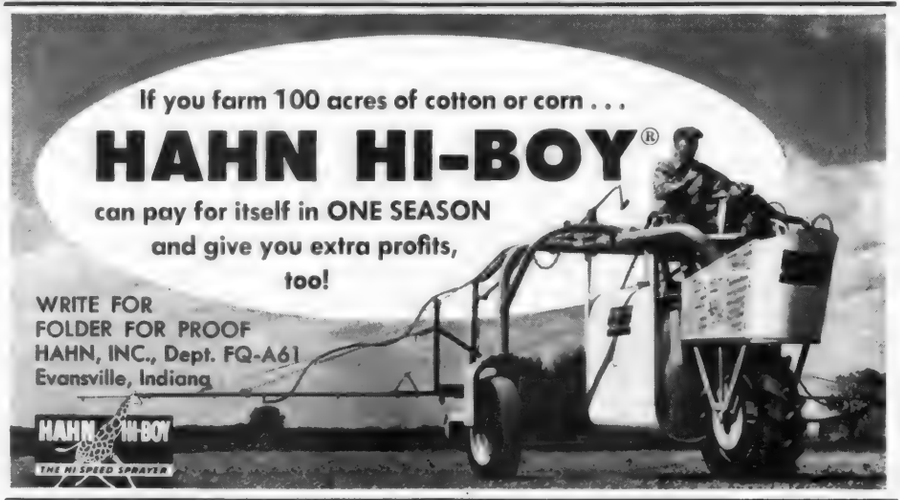
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when going after insects. Frequent flying patrols are made in search of bugs.

Compared to other species of woodpeckers the Redhead is unique in that he eats more vegetable than animal matter. As high as 65 percent of the gastric contents of other woodpecker species is insects. Not so the Redhead. His woodpecking power is not to find insects, but only to hollow out nests and holes to store acorns and other nuts.

From an economic point of view little objection is raised to the eating of the acorn as it cannot be put to better use than to provide food for wildlife. But when almond and walnut orchards are planted close to a grove of oaks, the Redheaded woodpeckers will make a few sorties into the orchards and will store these nuts in properly sized holes pecked out for them. The interesting point with the walnut storage is how they figure out how to open the rock-like shell. They simply store it in a hole for several months. The weather causes the shell to separate in halves. All the woodpeckers have to do is to take the nut out; the halves are separated and it's a clear case of eating nuts on the half-shell.

With acorns, the nut is not always extracted to be eaten. Some birds will crack the shell, pick out the mast and leave the shell in the hole. If the acorn is removed, the bird will carry it to some crotch, stub, or pole, and again firmly wedge it in a crevice. Then he cracks open the top of the acorn and feeds upon it much the same as we eat a soft-boiled egg in an eggcup.

This woodpecker is one of the most sociable and clannish of birds. The members of a flock become so closely associated that nest excavation, incubation and feeding of the young are carried out through the cooperation of two or more pairs.

The birds are definitely polyandrous as one female will mate with two or more males during the breeding season.

They hollow out cavities of about six to ten inches in diameter in the decayed parts of valley or live oak for nests.

They also peck out nests in telephone poles. Henry Maerchie, lineman for the Pacific Gas and Electric Company at Concord, has seen the birds hollow out the entire middle of an 18-inch diameter pole and weaken it to the point it had to be replaced.

The female will lay four to five dull-gloss white eggs. The mating season begins in April and the nesting period will usually be over by July. One brood is reared each year. The birds have been found nesting from sea level along the coast to 7,000 feet elevation in the Sierra Mountains.

When a nest is being excavated, the birds will work in shifts. As soon as one bird tires of pecking away at the dead wood, another flies in and takes up the hammering to scoop out a large enough hole. Usually, they start in on the underside of a horizontal limb or the side of a vertical trunk.

In the finished nest, the female lays her eggs. And here again the communal cooperative life is shown. If the female leaves the nest another bird, usually a male, will fly in and keep the eggs incubating. When

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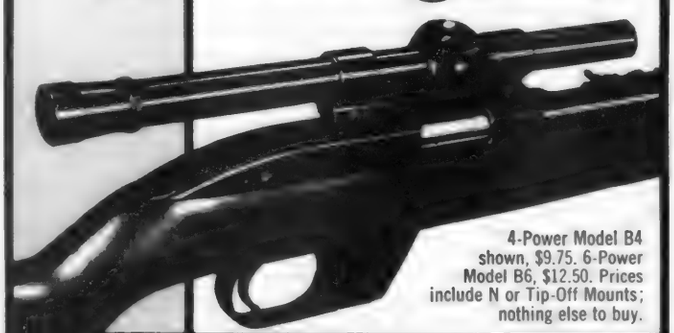

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the young hatch out, several birds feed the young. As near as can be observed, the young receive much the same diet as the old folks.

The cooperative spirit is particularly apparent at acorn harvest, when a dozen or more birds will team up to drill holes in the trees, or in many manmade structures.

Another cooperative action is their militant action against acorn robbers. Although they have much bickering and minor differences among themselves, it is astounding how well they do agree upon the defense of their common wealth. Here they show a great unanimity of action; whole squadrons of them combining to drive off such natural thieves as jays, magpies, and squirrels.

Chipmunks, squirrels, jays and other woodpeckers raid the granary trees and posts as often as they dare. Enough stealing goes on to benefit other wildlife when this acorn supply may spell the difference between survival and starvation to the thieves.

The bird is as thrifty as a miser and as industrious as an ant, but at times he can be quite stupid. Lorens Foard at Diablo, California, tells how the bird apparently hasn't enough reasoning power to cope with a hole in a shingled roof. The hole, pecked through the roof, had no bottom, but the Redhead kept hammering acorns right through into the attic below. But since the hole remained, it must be filled. So the process was repeated for days until an extra fat acorn stuck. This stacked up a pile of acorns inside the building causing more annoyance to Foard than aggravation to the woodpecker for all his wasted efforts.

George Wood, a rancher just out of Danville, California, tells this one: He was sitting on the porch of his ranch home one morning when he heard a clattering. He looked around but saw nothing. In a few moments it was repeated. He walked out in the yard and looked up at his house. There sat a Redheaded California woodpecker near the rainspout cocking his head in a listening attitude. Soon another bird flew up with an acorn in his mouth; he lit just over the spout opening and dropped the acorn down the drain. It made a bouncy clatter on its way down. Both birds sat with cocked heads listening to the noise. Then with the characteristic "jay cup, jay cup" "tchurr" they flew off, to return in a few seconds with more acorns. "Those darned birds, and several more that joined in, dropped at least a gallon of acorns down that rainspout. I know it was just for the fun of hearing the rattle."

It is interesting to note that the birds never store acorns in the tree on which they grow. They will always pick an acorn and transport it to a "granary" tree, flying perhaps 100 yards in the process.

Several famous granary storage trees are located throughout California. In one large live oak in Strawberry Valley in the San Jacinto Mountains in southern California an estimated 50,000 acorns have been embedded in the one tree in a pattern less than one inch apart. It has taken years for this effort to be completed. These stores once started are added to each year.

In Napa County, 41,000 acorns were counted in a large Ponderosa pine. The holes were bored at an average of 60 per square foot. Figuring seven acorns to an ounce, this is 366 pounds of acorns in one pine tree.

Economically, the bird sits in a neutral corner. A regrettable taste for fruit is his worst weakness. He eats many types of wild berries. If peach or apricot orchards are planted near a grove of oaks housing a community of the Redheads, the birds cannot resist the ripest, sweetest fruit. But little actual crop damage is reported due to these birds.

The harshest complaint against them is their hole-boring in telephone and light poles, fence posts and buildings.

The birds seem almost human in many of their actions. Perhaps it is we who copy them for they have always had a surplus. They never eat a tithing of the harvest. But the birds do their hoarding from force of habit or provident instinct. Often when the acorns are all harvested they will busy themselves storing worthless pebbles.

This species seems to be "hipped" on the subject much the same as an old miser who goes on hoarding gold.

# No BABY SITTER NEEDED!

## continuous flow

# M-C GRAIN DRYERS

WITH *new*

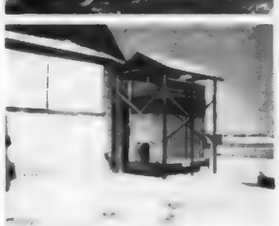
**AUTOMATIC MOISTURE CONTROL**

*Optional Equipment

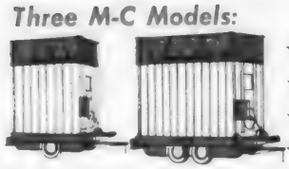
Now you can dry grain C-O-N-T-I-N-U-O-U-S-L-Y without worry or guess work . . . just set it for the dryness you want—*and forget it* . . . Automatic Moisture Control* does all the work! Whether you sell grain or put it in a bin for government storage, *all your grain* has the same moisture content.

As you bring in the wet grain from the field, place in top holding hopper . . . grain flows from hopper into drying and cooling chambers on both sides of dryer where two powerful fans (one for heating and one for cooling) DRY GRAIN QUICKLY . . . and *cool, dry grain* flows out automatically! ***NO BABY-SITTERS ARE NEEDED FOR M-C!***

Before you buy any dryer—*get the facts on M-C*—and then make your comparison. NO OTHER DRYER offers all three: (1) Push-button ease of operation (2) Quality of dried product and (3) Low cost of equipment PLUS . . .



*Three M-C Models:*



- ★ ***AUTOMATIC MOISTURE CONTROL***
- ★ ***ADJUSTABLE SPEED CONTROL***
- ★ ***ADJUSTABLE HEAT CONTROL***
- ★ ***AUTOMATIC SAFETY CONTROL***

Model 300—For average farm. Dries and cools up to 160 bushels per hour.

Model 400 — For larger farm. Dries and cools up to 210 bushels per hour.

Model 600—High capacity unit. Dries and cools up to 330 bushels per hour.

All dryers equipped with holding bins and/or automatic leveling augers for wet grain. Either tractor PTO or electric drive. LP Gas fuel.

**SALES AND SERVICE NEAR YOU**—see your dealer for demonstration, or write for **Grain Dryer Plans Book**

*AVAILABLE FOR ASC FINANCING*

CLIP AND MAIL FOR FULL DETAILS

MATHEWS COMPANY • Crystal Lake 16, Illinois

Send me your GRAIN DRYER PLANS BOOK and COMPLETE DETAILS OF M-C GRAIN DRYERS.
Our combine(s) is/are_____
(make)

NAME_____

ADDRESS_____

☐ Check here, if you want details on the M-C Rotary Scythe and M-C Chopper.

# Pump Talk by Deming

### Gallons & Gallons!

So, you have a deep well! If it's to be 4 inches or larger — and practically any depth—your DEMING well driller or pump dealer will probably suggest one of these dependable DEMING Submersibles.

Here is a unit that will pump more water at a greater depth than the rod or jet type pumps. This will give you all the water you want, when you want it! These high capacity, high quality DEMING's will give you up to 1,700 gallons per hour.

### No Pit—No Pump House.

That's right, no need for an expensive pit or pump house with a DEMING Submersible. The tank and controls can be located away from the well with the service line placed below ground. The entire pump, motor and all, is deep in the well, protected from freezing and tampering. It never needs priming and is practically noiseless in operation.

### No Worry About Corrosion!

Your DEMING Submersible is made of brass, bronze, stainless steel, and exclusive DEMING Fianite® materials. These noncorrosive materials mean that your pump will give you years of trouble-free service.

### Water, Water—Everywhere!

Plenty of water for every faucet; for every use in house or farm. DEMING Deep Well Submersibles will do the job!

FREE OFFER

Please send complete information on

☐ Submersibles ☐ Water Systems

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

**The DEMING Co.**

814 Broadway • Salem, Ohio


## FOOD FOR PEACE

(*Continued from page 73*)

toward the maintenance of our embassy and various missions in India—or in any country buying under this program. One of the largest uses of these soft currency funds is for loans at four percent interest to the government which just paid them to us. Close to three billion dollars worth of foreign currency have been loaned in this way. These loans are usually for a 40-year period, though some—one to Japan and one to Austria—have already been repaid. The greatest purpose of such loans is for industrial and mining development. In India a large loan was made for the great river valley development projects. Some loans should affect our future farm trade. These include money for building and improving ports and road systems, and for building grain storage.

Some of this nonconvertible money is used for loans to American commercial firms for such purposes as hotel building, steel mills, corn products mills, bakeries, dairy plants, and soft drink establishments. Some of the soft money is used for exchange students and for scholars studying overseas on Fulbright fellowships. We also spend a sizable amount in promoting commercial dollar sales of farm products. This is done by straight advertising, promotional contests, and all the razzle-dazzle we use here including cotton queens, wheat queens, and maize maids. More basic are training classes for bakers and millers to teach them the difference between our wheat flours and theirs; home economic demonstrations to promote the proper use of our food exports; and research grants for studies to increase use of grains, cotton, dairy and meat products, and oils.

### Bulgor Wheat

One effort to adapt our export products to the food habits of Far Eastern nations was started last May when we began the export of Bulgor wheat. Bulgor wheat is a wheat product that is hulled and broken into hard pellets and partly cooked. It does look a little like small brown grains of unpolished rice and is thought by some to be a rice substitute. A more candid view was given by an official who said, "If you're a lover of rice, you would hardly call this a rice substitute; but if you dislike wheat and cannot get rice, Bulgor wheat is better than nothing." It may also be a transitional food in helping to broaden the Far Eastern eating habits from rice alone.

The Secretary of Agriculture and George McGovern believe if Congress extends 480 and endorses other long-term agreements like the one negotiated with India, sales for foreign money will amount to around one-and-one-half billion dollars a year during the next five years.

Second to sales for foreign currency has been the barter program. Under this program we have bartered our surplus wheat, cotton, corn, and other farm products for such strategic materials as antimony, baux-

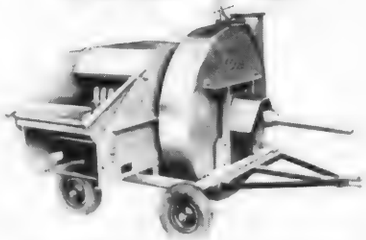

**3 MACHINES IN 1**

it's a . . . BLOWER
. . . RECUTTER
. . . GRINDER

it's KOOLS

ALL NEW MULTI-PURPOSE

**KB40**



**FORAGE HANDLER**

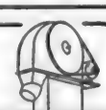
- Being a "Kools", you know it will blow at high capacity into the tallest silos.
- Recuts high moisture crops (ear corn and grass)—blows any silage with equal ease.
- Grinds shelled corn, oats, barley, ear corn, milo, hay, wheat, soy beans—any small grain—into fine, flour-free palatable feed. Grinds shavings, corn cobs for bedding or mulch.
- Complete screen size selection for full range of controlled cut.
- Change over from one operation to the other in a few minutes. Can be used as blower only.
- Kools new, controlled flow tilt-up hopper feeder available for loading KB40 when using end unloading wagons or dump trucks.

SEE KOOLS ALL NEW KB40, KB30, KB20 NOW . . .

**KOOLS BROTHERS INC.**

P. O. BOX 918 APPLETON, WIS.

Reduce handling costs . . .



**HANCE ELEVATORS**

Hance belt and bucket elevators are easily installed and economical to operate.

Six standard models — Capacities range from 50 to 1,000 bushels per hour

For complete specifications and prices write

**J. W. HANCE MFG. CO.,**
Westerville, Ohio

# All fertilizers of the same analysis are not alike!

Check yourself on the following question. Don't be surprised if you miss. Fertilizers are a rapidly changing part of this business of farming.

*If they will pass a state test, are all fertilizers of the same analysis alike?*

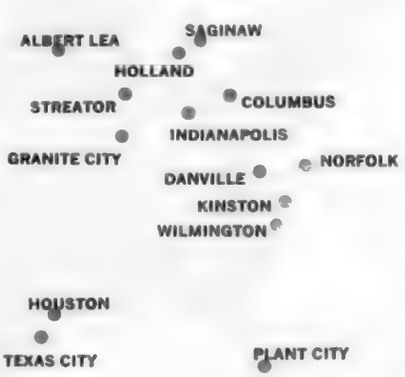
SMITH-DOUGLASS ASKS:
ARE YOU UP TO DATE ON FERTILIZERS?

☐ YES

☐ NO

Not too many years ago, if you answered "yes," you would have agreed with the experts. Today as research men understand more about fertilizer, the correct answer has to be NO. There are too many things that affect the final yield that CAN be different in various products, even though they all pass the same minimum tests. For example, the process by which they are made, the exact compounds that are in the final product, the kind of NITROGEN used, the kind of PHOSPHATE used, the kind of POTASH used, the other compounds that are in the product, the trace elements, the secondary elements, the uniformity of analysis, the way in which the fertilizer is used.

All of these things . . . and many more . . . we will discuss with you in future issues. We hope you will find it interesting and helpful. Your comments will be appreciated.




**JOEL ANDREW HUNEYCUTT**
**Stanfield Chapter, Locust, N. C.**

Joel is attending North Carolina State College, with the assistance of a Smith-Douglass scholarship. He served as president of his FFA chapter, and plans to enter some phase of forestry upon graduation from college.

**SMITH-DOUGLASS**
**COMPANY, INC. • HOME OFFICE: NORFOLK 1, VIRGINIA**

*Smith-Douglass Co., Inc., manufactures and distributes fertilizers and chemicals for agricultural and industrial use, including sulphuric acid, anhydrous ammonia, phosphoric acid, nitrogenous tankage, phosphate rock, superphosphate, farm fertilizers, lawn and garden fertilizers, feed phosphorus supplements . . . dicalcium phosphate and defluorinated phosphate . . . potassium silicofluoride and potassium fluoborate.*

# close the "resistance gap"....

HESS & CLARK
NET CONTENTS 450 CC
nf-180®
SUSPENSION
FOR THE TREATMENT OF WHITE SCOURS IN BABY PIGS
SHAKE WELL BEFORE USING
Each cc contains 100 mg. furazolidone* with suspending and dispersing agents and 0.15% parahydroxybenzoate esters as preservatives.
HERD SIZE WITH FURAMATIC DOSE DISPENSER
HESS & CLARK, ASHLAND, OHIO
DIVISION OF RICHARDSON-MERRELL INC.

All bottles come with special FURAMATIC DISPENSER—just depress plunger for 2 cc dosage. Available in Regular Size (100 cc bottle at 8¢ per dose) or Herd Size (450 cc bottle at 6¢ per dose). Write for free booklet, "Close the Resistance Gap."

## See 24-hour results against baby pig scours

From the moment a baby pig comes into this world, until he builds up natural vigor to fight off bacteria, he is handicapped by a "resistance gap" which makes him a prime target for scours.

Be ready to help your pigs through this "resistance gap" with nf-180 Suspension. Here is a new oral treatment that shows results quickly, before scours have a chance to stunt and kill.

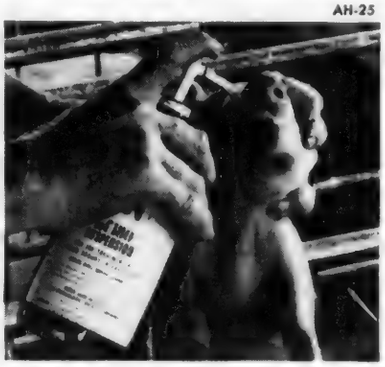
nf-180 Suspension works! From every swine-producing area come enthusiastic reports. University trials show a saving of up to 25% more baby pigs. nf-180 contains furazolidone which actually kills germs by starving them to death (unlike antibiotics and sulfas which merely slow down microorganism growth).

### Treat the sow—to protect the pigs

Rather than wait for baby pig scours to strike, add nf-180 to the sow's ration one week before and two weeks after farrowing — for extra pigs saved and weaned . . . faster-growing pigs. And for further protection, add nf-180 to the pigs' pre-starter, starter and grower ration.

For immediate action, get nf-180 Suspension from your drug, feed or farm supply store — and ask your feed dealer about mixing nf-180 in the ration.

AH-25



PUT MORE HEALTH INTO LIFE BY STARVING GERMS TO DEATH

**nitrofurans**

**HESS & CLARK,** Ashland, Ohio
Division of Richardson-Merrell Inc.

ite, manganese, chromite and tin. This exchange was started by the Commodity Credit Corporation in 1948. To begin with, stockpiles were built up at around $400,000,000 a year. During the last four years this program has decreased to around $150,000,000 a year.

In addition to barter and the soft currency, huge quantities of our surpluses are given away to nations in need. One way is through voluntary agencies such as CARE; the Catholic Relief Services; the Church World Service of the National Council of Churches of Christ; Lutheran World Relief; Mennonite Central Committee; Salvation Army; American Friends Service Committee; Heifer Project; and others. These agencies must be accredited by the government and must supervise distribution to make sure the goods are actually put into the hands of the needy. Mother and child feeding set up by these organizations has lowered infant mortality in such areas as northeastern Brazil from a staggering 80 percent to around 10 to 15 percent.

The government, too, will give to meet a temporary emergency or to set up a program which will gradually be self-supporting. Here, too, we insist a United States mission supervise the distribution to be sure food actually reaches the needy.

**School lunches prevent nutritional diseases in children. Brazil and India recently started such programs.**

Huge tonnages of food have been shipped to fight famines. The 1960 earthquakes and fires in Chile left great numbers of people homeless and without food; typhoons swept the Ryukyu Islands in the fall of 1959; locust swarms crawled and flew across Ethiopia during the past three years; drouths in Egypt destroyed crops and brought hunger which we were able to alleviate with rice and wheat. The refugees who form a constant stream into the free world from behind the Iron Curtain, and those who fled the disorders of Algeria into Morocco and Tunisia, were fed with our surpluses.

Gifts have also been made to foreign gov-

JUHAN 1st P.R.I. STAR CHAROLAIS BULL IN U.S.A.

FROZEN SEMEN $4.00 per ampule

OLENTANGY FARMS CHAROLAIS

Buy Performance Registered Calves from Progeny Tested and Production Registered Cows and Bulls from the First Charolais Herd in Midwest. ¾ and ⅞ Cows with Calf Available Now.

L. A. DEMOREST & SONS Waldo, Ohio

Charter Member AICA SA 6-3519 or SA 6-3625

*Powerful New* **BEAR CAT GRAIN & ROUGHAGE MILL**

**grinds any feed . . . green, dry, wet or frozen!**

This rugged Bear Cat is famous for handling the real tough grinding jobs with any farm tractor. Three tool-steel circular knives and fourteen heavy steel swing hammers make fast work of any feed. It will grind ear corn, snapped corn and all grain as fine or as coarse as you want including soybeans, hershey, millet, cane-seed, cotton seed, linseed (or cake), and cotton bolls. It cuts and grinds any kind of hay or roughage loose, bundled or baled. For complete information see your dealer or write factory.

**BEARCAT** *Quality* **FARM MACHINERY SINCE 1908**

**WESTERN LAND ROLLER CO. • DEPT. FQ-62 • HASTINGS, NEBR.**

BELT **BROD-KASTOR**

THE FASTEST ACCURATE WAY TO FERTILIZE FOR FALL AND WINTER PLOW DOWN!

AT 200 POUNDS OF UREA PER ACRE, SPREAD 10 ACRES IN 20 MINUTES WITHOUT GETTING OFF THE TRACTOR!

**THE BELT CORPORATION**

DEPT. FQ ORIENT, OHIO

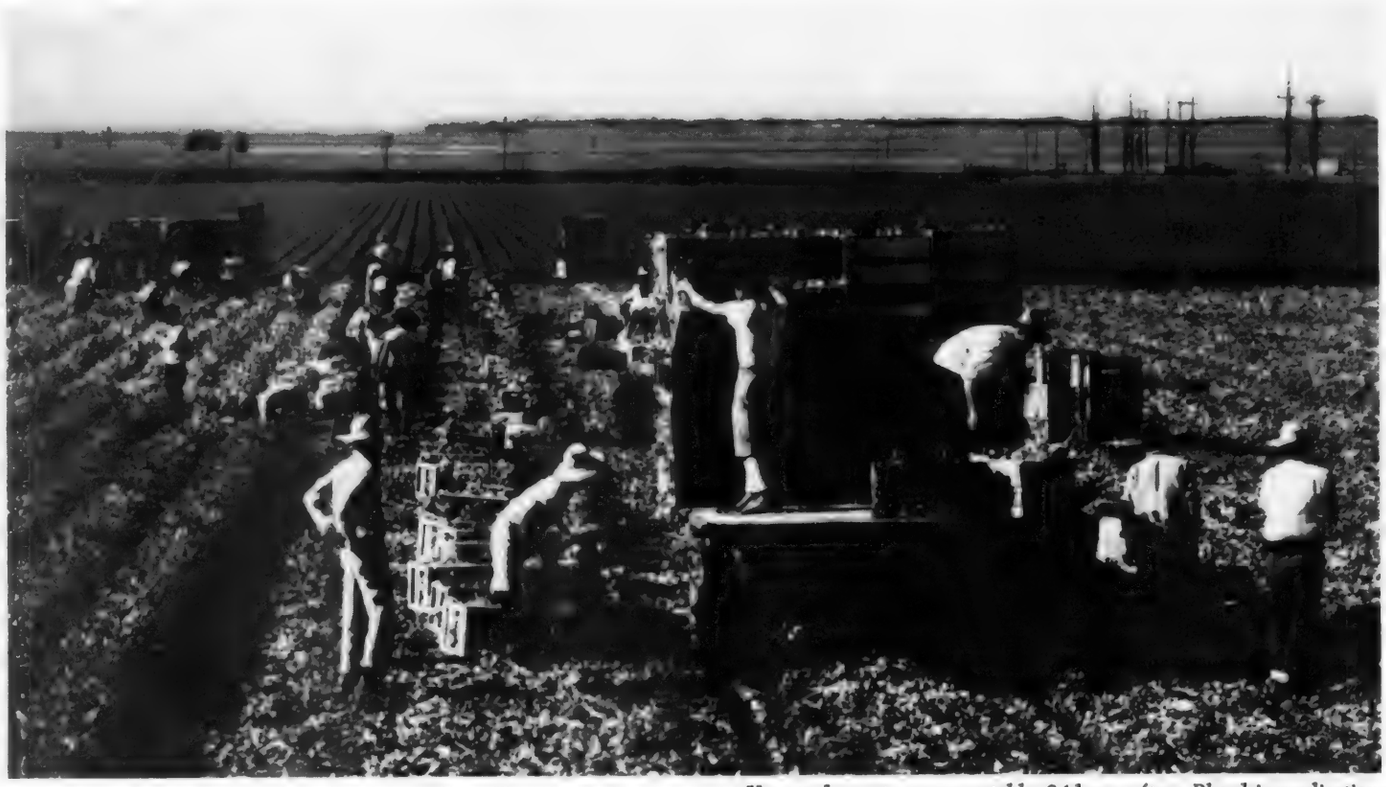
Makers of HARVEST-HANDLER and UTILITY portable elevators

Please send me more information on the BELT BROD KASTOR

NAME _____

ADDRESS _____

TOWN _____ STATE _____



*You can harvest many vegetables 24 hours after a Phosdrin application.*

# VEGETABLES:

## Now—Phosdrin® Insecticide lets you control destructive insects on many vegetables as late as 24 hours before harvest without creating a residue problem

**Phosdrin is the remarkable phosphate insecticide that gives you fast knockdown and kill of the toughest insects—then disappears without leaving any residue. Here are the details:**

A LATE SEASON insect build-up can quickly make many vegetable crops unsalable. If the infestation is controlled with an insecticide that leaves excess residue on the crop at harvest, it is still unsalable.

This is a problem that many vegetable growers are solving with Phosdrin Insecticide. It kills the toughest insects fast, usually within a few minutes of application. However, unlike most other insecticides, Phosdrin disappears rapidly after it has done its job, leaves no residue.

That is why Phosdrin can be applied up to 24 hours from harvest on many vegetables. See table for more complete interval data.

**ACCEPTED INTERVALS FOR PHOSDRIN INSECTICIDE**

| CROP: | BEANS, ONIONS | CARROTS, EGGPLANT, PEPPERS | BROCCOLI CABBAGE & OKRA | BRUSSELS SPROUTS, CAULIFLOWER, COLLARDS, KALE, CELERY, BEETS (INCL. TOPS) | CANTALOUPES, HONEYDEW MELONS, MUSKMELONS, SUMMER SQUASH, WATERMELONS | CUCUMBERS, PEAS, TOMATOES, POTATOES | LETTUCE |
|---|---|---|---|---|---|---|---|
| Days between last spray and harvest | 1 | 2 | 1 | 3 | 1 | 1 | 2 |

### Where to get Phosdrin

Phosdrin is available as liquids and dusts from your local insecticide dealer under many well-known brand names.

Shell Chemical Company, Agricultural Chemicals Division, 110 West 51st Street, New York 20, New York.

SHELL

**Phosdrin®**
Insecticide
A PRODUCT OF SHELL CHEMICAL COMPANY

ernments for the establishment of a school lunch program. Often this food provides the kids with the only square meal they get. In Italy the school lunches are gradually being turned over to the government. In Madras, India, a new agreement was recently signed which will feed a half-million children and be administered by CARE. The Madras lunches, largest in the Far East, will consume 6,250,000 pounds of dried milk, 3,000,000 pounds of vegetable shortening, 3,000,000 pounds of cornmeal, 2,600,000 pounds of Bulgor wheat, and some rice.

The first school lunch room program for a Latin-American country was signed May 12, 1961, with Peru. As with all of these projects, the receiving government will gradually take over.

### Food for Pay

To many observers the most promising and sensible use of our food gifts is the food for pay program. This was started as an experiment to meet the tremendous unemployment which was creating chaos in Tunisia in 1958. With some U.S. financial help, men were put to work on large public projects, receiving half their wages in cash and half in wheat.

This combination of food and cash pay seems to have met one of the most serious problems faced by a nation developing itself industrially. Sixty to 90 percent of the population work and live on farms. If large groups of them quit farming and work on jobs which do not immediately produce food or usable goods, inflation results. The food supply diminishes, the demand increases as more money becomes available. Food prices skyrocket. This problem has been very neatly solved by food for pay.

Public works and food for pay also have the great advantage of helping toward self-sufficiency. In Tunisia, for example, some of the major projects were soil conservation, reforestation, drainage and land reclamation, irrigation and canal building. These will all help solve Tunisia's food problem.

George McGovern said, "I believe the most direct and lasting rewards will come from integrating our food with economic efforts. I talked with President Bourguiba and other Tunisian officials when he made his state visit here. I discussed this at great length with the United States Mission chiefs in Tunisia and other officials close to the project and I have yet to find a single person, either on the American or Tunisian side, who isn't enthusiastic about this project. We now have a similar food-for-pay operation going in Morocco which employs some 200,000 workers. Ethiopia is negotiating another work program which will use grain sorghum—twelve thousand tons of it—in preference to wheat to pay workers on dams, roads and reforestation. Five other nations—Dahomey, Greece, Indonesia, Iran and Taiwan—are negotiating with us for similar programs, and 20 other African, Asian, and Latin-American countries are most interested."

650-gallon Dari-Kool in the up-to-date milkhouse of the Wisconsin State College Experimental Farm, River Falls, Wisconsin.

# "This DARI-KOOL Is Cooling 143 Lbs. of Milk on One KW of Electricity!"

Writes MR. A. M. ANDERSON, Manager, Pierce-Pepin Electric Cooperative, Ellsworth, Wis.

"As you know, last Fall we sold and installed a 650-gallon Dari-Kool, equipped with a two-horsepower compressor, to the Wisconsin State College at River Falls, Wisconsin. In order to prove Dari-Kool's economy of operation, we installed a meter on this cooler so as to cover the operating cost of the compressor, the water pump and agitator motor. *Here are the results* —

In the three month period of December, 1960, January and February, 1961, a total of 128,777 pounds of milk was cooled to 38 degrees using a total of 900 kilowatts. This amounts to 143 pounds of milk per kilowatt of electricity used. The electric rate in our area is 1½ cents per kilowatt. *(This means that the Dari-Kool is cooling milk for slightly over 1 cent per 100 pounds.)* In addition the blend temperature always remained well below 50 degrees.

You can readily understand why all of us are well pleased with Dari-Kool's economy and performance."

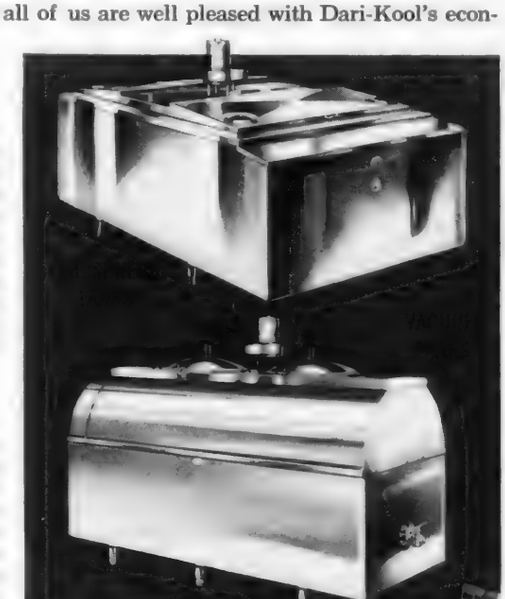
## HIGHEST QUALITY MILK

*It is generally known that bacteria multiply 5 times faster in milk held 24 hours at 50° F than in milk held 24 hours at 40° F. At 70° F, bacteria multiply 700 times in a 24 hour period.* To maintain high quality and retard the rapid multiplication of bacteria, milk should be rapidly cooled to below 40° F. With Dari-Kool's 33° F ice-water cooling milk is cooled faster than is possible with any other method. Dari-Kool tanks easily surpass 3A Cooling Standards.

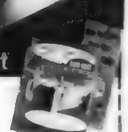
## FAR SUPERIOR COOLING

Whether you choose an Atmospheric or a Vacuum tank you'll produce better milk with a Dari-Kool because Dari-Kool's ice-water method does a far better job of milk cooling. There's no *"churned"* or *"frozen milk"* to affect the butterfat test. *Remember — more than 90% of all dairy plants use ice-water systems to cool their milk.*

DARI-KOOL
BULK MILK COOLERS



Mail Coupon for FREE Milkhouse Plan Kit



DAIRY EQUIPMENT COMPANY
DEPT. 69, Madison, Wisconsin

Please send FREE Milkhouse Plan Kit and Purchase Plan information.

NAME.....

ADDRESS.....

TOWN..... STATE.....

Announcing the NEW
Eversman
TM LAND SMOOTHERS
for IHC "Fast Hitch" Tractors

Low cost, maneuverable, the ideal tillage tool. Six different size and price models—6', 8' and 10' blades for small fields. 10', 12' and 14' blades for larger acreages. Low initial investment since tractor length furnishes additional effective leveling length. Larger capacity dirt moving with reduced operating costs.

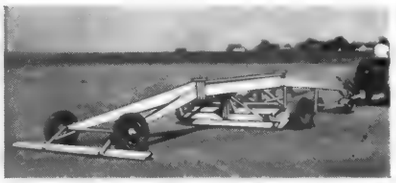
6 TM LAND SMOOTHERS
for 3-Point Hitch Tractors

Fit all standard 3-point hitch tractors. Six different size and price models for maintenance, tillage, land forming . . . to correct surface drainage problems, fill washes and gullies, smooth terraces, benches, waterways.

Announcing the NEW
Eversman
TANDEM SCRAPERS

Move 5 yards of dirt per trip with your regular 4-plow tractor and the Eversman Tandem Scraper Combination. Haul two loads for the operating cost of one—with the lowest priced initial investment available. Use the Eversman Tandem Scrapers in combination to accomplish long haul, high yardage dirt moving—or use them individually on separate tractors for small construction jobs such as drainage ditches, pit silos, pot hole filling, etc.

and the 329, 410 Eversman
LAND SMOOTHERS



32 and 40 foot Automatic Land Levelers and Hydraulic Scrapers for 3 and 4 plow tractors for all "on the farm" land smoothing and seed bed preparation.

NOTE: FOR LAND OUT OF PRODUCTION THIS YEAR you will find summer the ideal time to fill water holes, build drainage ditches, terraces and grass waterways, provide surface drainage for good moisture management practices.

*Write for FREE Booklets*
*Students Request Special Literature*

EVERSMAN MFG. CO.
Dept. 67 • Curtis and Fifth • Denver 4, Colorado

### A Chicken in Every Port

One provision of P.L. 480 which might lead to an increase in our farm sales is Title 4, which permits us to sell farm commodities to a foreign country for dollars on a long-term loan basis. So far not a single sale has been made under this authority. It is hoped, however, we may be able to transfer some of the soft currency sales to long-term loan sales. This would amount to a net gain in total exports, since we could then add to our soft money sales at least to the extent Congress has authorized.

Another program which may have long-term results is the investigation into an expanded use of feed grains for building up foreign poultry and livestock industry.

Right now, Dr. Jonathan Garst is carrying out a study in South America for the Food for Peace administration. One plan being considered is the development of large-scale broiler projects near ports, where feed grains can be delivered cheaply by ship. Unlike beef or pork, there are few taboos against eating chicken; and chickens can be sold live on the market and killed by the consumer, eliminating refrigeration. Finally, broilers are efficient converters of feed into protein. Once a project is started it is hoped it will become a potential buyer for U.S. surplus grains.

We are not the only food-exporting nation; nor are we the only nation in nonprofit food distribution. None of the others, however, is giving or loaning on such a scale. What do they think of our expanded program? John McEwan, Deputy Prime Minister and Minister for Trade of Australia, a country heavily dependent on agricultural exports, said, "Any important further broadening of surplus disposal must unavoidably harm Australia's commercial opportunities. In consequence, there would have to be some American assumption of obligation which would allow our industry and export earnings to continue."

The conflict is between our desire to help countries who are working to develop themselves economically, and our reluctance to harm friendly food-exporting nations. This is the fine line which Mr. McGovern must walk in pressing for an expanded program.

A recent survey by members of his own staff and USDA economists has shown that, if the bare minimum nutritional requirements of the peoples of the free world were met, all of our surpluses would not do the job. He knows that if the free world is to survive, total food production as well as industrial capacity must be increased. As he said, "We should thank God that we have a food abundance, and use the oversupply among the underprivileged at home and abroad."

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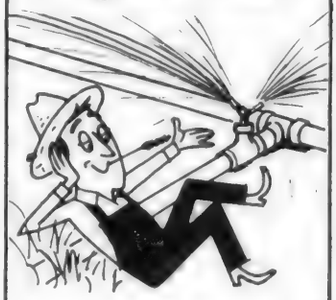

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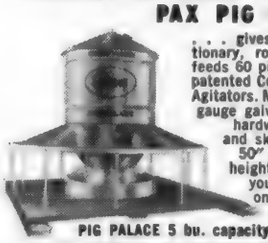

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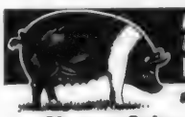

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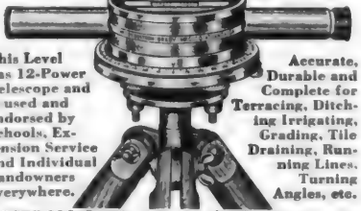

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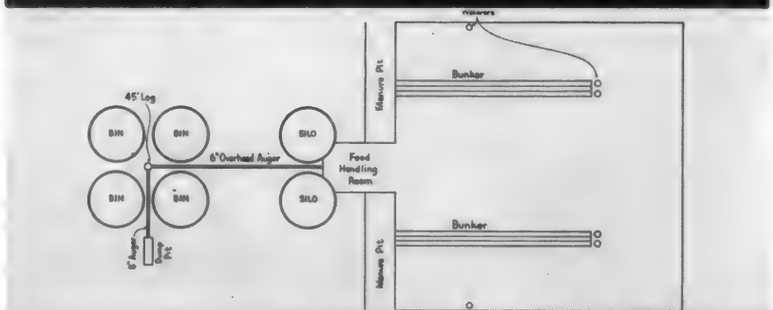


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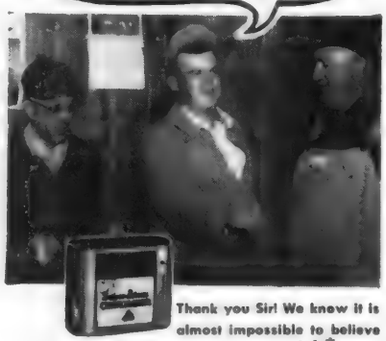

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## TIMING SWINE FEED ADDITIVES

(*Continued from page 55*)

biotics 5 to 10 days before farrowing until early weaning of her pigs at three weeks of age. The litter averages 0.5 more pigs, nine percent greater livability, and 3.15 pounds heavier weaning weights per pig.

The next most profitable timing for antibiotics is before breeding, when 25 milligrams should be added per pound of feed for 5 to 10 days. The antibiotics reduce stress in the sow at a critical period, resulting in a successful start of 16 percent more pigs. The cost is about 35 cents per sow; the gross returns, 61 cents per sow; and the return per dollar invested, $1.74.

A rate of 25 milligrams per pound of feed is common when feeding antibiotics to grower pigs from 25 to 50 pounds. After that time antibiotics can be eliminated from the ration, provided the disease level of the herd is normal. For the period between 25 and 100 pounds, feeding antibiotics returns $1.43 per dollar invested due to decreased feed consumption. Pigs on antibiotics eat 5.9 pounds less and have 9.6 percent greater gains. The cost is 23 cents and one dollar returns 33 cents per head.

From about 50 to 150 pounds, returns from antibiotics slip to $1.13 per dollar invested, not including possible benefits from having pigs ready for market a week early. Gains are 7.8 percent greater and 11 pounds less feed is required per hundredweight, a 3.1 percent reduction. Antibiotics expenses are 38 cents, returns 43 cents.

Dr. Damon Catron and his co-worker add a reminder that in feeding antibiotics over a period, the kind added should be rotated. Used in this way, antibiotics will not lose their effect over the years.

### Arsenicals

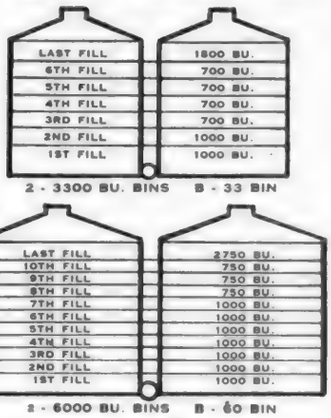
Arsenicals, along with the antibiotics and the nitrofurans, make up a group called chemo-therapeutics, chemicals which promote health. For pigs, arsalinic acid and 3-nitro-4hydroxyphenyl-arsonic acid (3-nitro) are in common use from the prestarter to the finishing ration. Like narrow-spectrum antibiotics, arsenicals restrict their combat against microscopic invaders mainly to the intestines. Arsenicals improve rate of gain and feed efficiency in addition to providing disease control.

### Nitrofurans

Nitrofurans are a group of compounds made from byproducts of crops like oat hulls and corncobs. The basic product is furfural, which was first used in refining lubricating oils to keep them from depositing a film of wax on the cylinder walls of engines and forming a sludge in the crankcase. Chemists found that by adding one nitrogen and two oxygen atoms, they had a compound that would kill bacteria.

The fact that nitrofurans kill bacteria instead of just setting them back, as do antibiotics, makes them a formidable weapon against disease. Being manmade chemi-

# LONG TWINS


LAST FILL 1800 BU.
6TH FILL 700 BU.
5TH FILL 700 BU.
4TH FILL 700 BU.
3RD FILL 700 BU.
2ND FILL 1000 BU.
1ST FILL 1000 BU.
2 - 3300 BU. BINS B - 33 BIN
LAST FILL 2750 BU.
10TH FILL 750 BU.
9TH FILL 750 BU.
8TH FILL 750 BU.
7TH FILL 1000 BU.
6TH FILL 1000 BU.
5TH FILL 1000 BU.
4TH FILL 1000 BU.
3RD FILL 1000 BU.
2ND FILL 1000 BU.
1ST FILL 1000 BU.
2 - 6000 BU. BINS B - 60 BIN

Typical daily fills for two sizes of **LONG Twins.**

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The **Long Twin-Bins** are designed to use the completely new, high capacity 7½ h.p. drying fan with LONG Supplemental Heater. With a single fan and heater **you can actually dry up to 1,000 bushels of corn per day!** This lowers your first cost, operating expense and up-keep costs. Automatic temperature and humidity controls make the job easy. LONG Twin-Bins are made in sizes that have a combined capacity of from 2,000 to 12,000 bushels.

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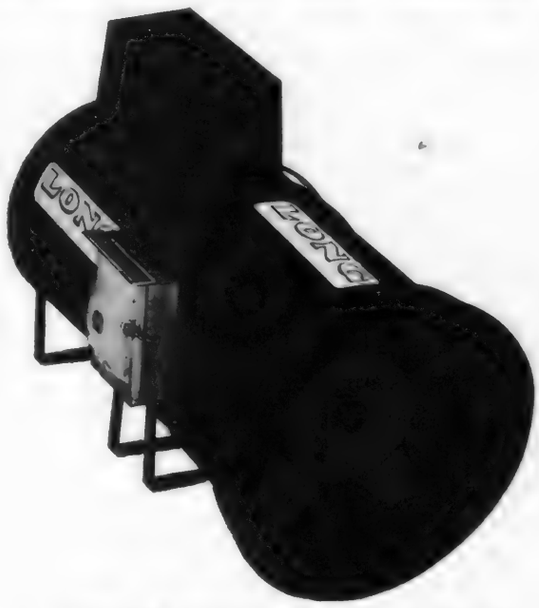


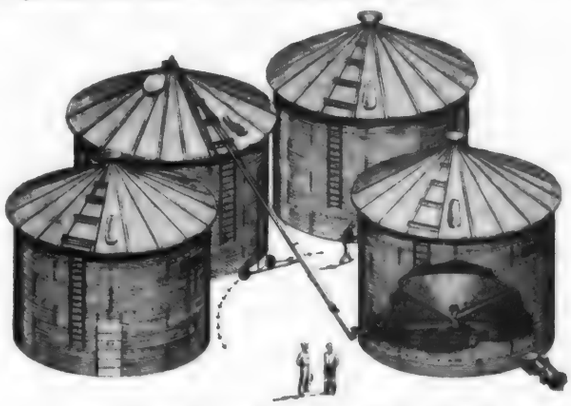

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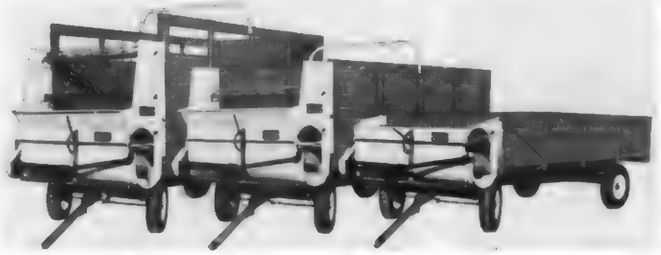

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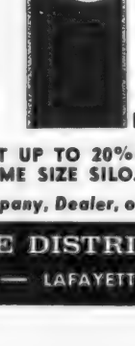

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cals, nitrofurans can be tailormade for specific troubles. Common nitrofurans kill a wide range of bacteria as well as some harmful protozoa and molds. To their further credit is, that being killers, nitrofurans don't give bacteria a chance to develop immunity. Thus, nitrofurans don't have to be rotated. Last, they don't accumulate in meat and are safe to feed right up to market.

Three well-known nitrofurans are furazolidone, nitrofurazone, and bifuran. They are particularly effective against scours, and their use is best timed before and after farrowing in the sow ration, and in the pre-starter and starter rations of young pigs.

For sows, furazolidone is recommended at three pounds per ton of feed one week before, and two weeks after farrowing. In a farm test this ration resulted in one extra pig per litter at weaning, and individual pigs weighing 1.6 pounds higher than control pigs.

Bifuran makes a good combination with 3-nitro (an arsenical) and antibiotics for preventing scours in baby pigs. Six pounds per ton for 14 days increases gain and feed conversion, as well as preventing scours. Furazolidone treats both black scours (necro) and bloody scours (vibrionic dysentery).

### Flavoring Agents

Flavoring agents used to make pigs eat more are newcomers to the commercial swine ration. Some flavors that have been tried are sugar, saccharin, vanilla, anise, chocolate, caramel, whey, butter flavor, sow milk flavor and molasses. Cane sugar, unrefined or refined, the only flavor practical so far, used as approximately 15 percent of the ration, generally seems to have more appeal to pigs than saccharin or molasses. Generally the best results with flavors are in the pre-starter ration, and the benefit from flavors decreases as pigs grow to 50 pounds.

In a trial by Francis Diaz at Iowa State, pigs from two to eight weeks of age with 15 percent cane sugar in the ration gained 5½ more pounds than pigs fed unsweetened rations. Feed consumed per pound of gain averaged just under one-tenth pound less for sugar-fed pigs.

Diaz added, though, that flavors aren't a sure thing at present. All pigs don't seem to have a sweet tooth, or crave the same flavors. And apparently flavor preference changes with age. The Flavor Corporation of America in Chicago is working on a combination of flavors that appeals to all pig palates. At present they market two flavor combinations. One, for young pigs, is used in starter and pre-starter rations. The other, for older pigs, is used in grower, fattening, and finishing rations.

In poultry, flavors have not only been used to boost feed consumption, but distasteful flavors have also successfully controlled feed consumption in university trials. How ill-flavored feeds will work out in hog rations remains to be seen. For the present, Dr. Catron and Diaz do not recommend minerals in the hog ration to reduce consumption. They feel bulk in the ration is a better method for sows, and restricted mechanical feeding best for pigs.

Feed preservatives affect nutrition only secondarily. Common ones are butylated hydroxytoluene (BHT) and sodium propionate. These are mainly aimed at preserving vitamins. Other types of preservatives such as propyl gallate, butylated hydroxyanisole, and citric acid in propylene glycol keep fat from going rancid.

The level of feed preservative and its timing is mainly varied with the level and timing of feeding fats and vitamins. The fat-soluble vitamins, A, D, E and K, oxidize faster than the others and are, therefore, most in need of a preservative.

### Anthelmintics

There are two main dewormers, or anthelmintics, used in the ration. One is piperazine and the second is hygromycin. It is possible to keep hygromycin in the ration continually, although there is evidence it can cause deafness after a time, so it isn't recommended for gilts and sows. Dr. Catron and Diaz believe that piperazine at a higher level can effectively be fed at intervals.

For intermittent use of piperazine, include it in the sow's ration just before breeding to knock out worms that might interfere with a sow's concentrating her strength on her embryo pigs. Dewormers in the ration just before farrowing keep baby pigs from picking up worms from the droppings of their dam. Another dose for a few

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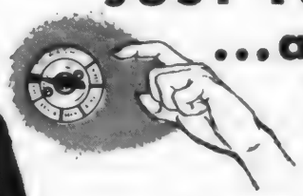

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**YOU'LL BE PLEASANTLY SURPRISED WHEN YOU COMPARE ZERO'S LOW PRICES WITH PRICES OF OLD-FASHIONED BULK MILK TANKS!**

New, *water-proof* URETHANE PLASTIC FOAM INSULATION increases ZERO's cooling efficiency, lengthens its life and makes it the strongest farm bulk tank possible to produce.

### ONLY Zero's ROUND-DESIGN, VACUUM AND PATENTED SPATTER-SPRAY WASHER MAKE THIS POSSIBLE . . . OPERATION IS SIMPLE!

The photo above shows how easy it is to operate this new ZERO's *completely-automatic* cleansing system. You simply set the *built-in,* automatic Timer-Clock . . . and *turn a single switch.* That's all!

The Timer-Clock automatically starts the vacuum pump. Vacuum draws the Drain Ball, shown in small photo above, tightly against the drain opening, sealing it shut . . . and also sealing the lids down tight. The detergent is flushed into the tank as the water passes through the *built-in* Detergent Jar before entering the tank.

**THIS IS A COMPLETE CLEANSING SYSTEM** . . . *with everything, including all Controls, built-in.* This ZERO has no conglomeration of makeshift gadgets to connect, insert in tank, remove, disconnect, wash and store away each clean-up.

**CLEANS BETTER!** Photo at upper right shows this ZERO's *exclusive, patented, built-in Spatter-Spray Automatic Washer in action.* Twin impellers hurl a double crossfire of water with *"tornado"* force . . . at and below the waterline . . . against this ZERO's round, stainless steel sides, ends and vacuum-sealed lids. Round-shaped . . . there are no hard-to-clean crevices or corners. Official records show that bacteria averages are greatly reduced by ZERO cleaning.

**PATENTED "SWOOPED-DOWN" OPENINGS** make all milk contact surfaces of this ZERO easily visible and accessible. Brushing is kept to a minimum.

**ZERO NOW COSTS LESS!** This is ZERO's new, compact BIG-SHORTY model . . . the *big* tank that fits into a *small* milk house. Even with this built-in, labor-saving equipment . . . savings due to compact design and volume production enable us to offer this new ZERO at reduced cost.

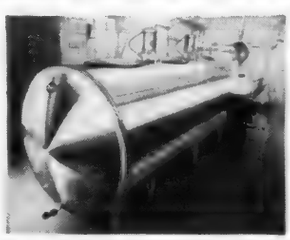
**SEE YOUR ZERO DEALER!** Mail Coupon today for full information, including specifications and sizes . . . location of your nearest ZERO installation . . . and name of your nearest ZERO Dealer!

ZERO CORPORATION
679-T Duncan Ave., Washington, Mo.
A BASIC MANUFACTURER

**ALSO GOOD USED EQUIPMENT**
. . . which has been traded in, now available at your ZERO Dealer's. Mail Coupon for details. No obligation.

### World's Largest Agricultural Research Farm . . . Owned by RALSTON PURINA COMPANY . . . Installs Most Modern Dairy Equipment!

If you visit this famous experimental farm, near Gray Summit, Missouri . . . you'll see the most up-to-date dairy farm equipment; including the ultra-modern, *completely-automatic,* 1200-gallon ZERO Bulk Milk Tank shown at right.



### FREE! NEW 14-PAGE ILLUSTRATED BOOK

—describes in detail everything you should know before you invest in any milk-handling equipment. Explains how modern ZERO AUTOMATION saves time, labor and increases milk profits. Gives full information about the ZERO T-20 COMPLETELY-AUTOMATIC VACUUM BULK MILK COOLER — including dimensions of all different capacity ZERO Tanks. Mail Coupon for FREE Book today!

**MAIL COUPON FOR FREE BOOK AND FULL INFORMATION!**

ZERO CORPORATION 679-T Duncan Ave., Washington, Mo.

Please send me FREE Book described above — location of nearest ZERO installation — and name of my nearest ZERO Dealer.

☐ I am interested in good used equipment

NAME .....

SIZE OF MY MILK HOUSE .....

ADDRESS OR RFD .....

TOWN ..... STATE .....

Zero®

T-20 VACUUM —*Nature's Own Way*

COMPLETELY-AUTOMATIC
BULK MILK COOLER
—with BUILT-IN SPATTER-SPRAY
AUTOMATIC WASHER

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IF IT ISN'T A Zero . . . IT ISN'T AUTOMATIC!

# Every lick of STERLING BLUSALT helps prevent a slump in autumn milk production & profits with 8 feeding essentials

PURE SALT Plus
MANGANESE
IRON
SULFATE SULFUR
COPPER
COBALT
IODINE
ZINC

When your cows move in off pasture, what usually happens? Milk production falls off, doesn't it? Well, it needn't. A modern management and feeding program (including Sterling Blusalt) will keep feed intake up, milk production up, and your herd in good health.

Sterling Blusalt—a pure, high-quality salt—contains the seven trace elements a cow must have for best health and peak lactation.

By offering your cows all the Blusalt they want, free choice, you help them feel better, feed better, produce better—even during the "fall-off" months. So stock up on Sterling Trace Mineral Blusalt right now. Keep a Sterling Blusalt Lik at each stanchion and an ample supply, both loose and blocks, in the loafing yard to help stop autumn milk production and profit slump.

Sterling Blusalt comes in 50 and 100 lb. bags, 50-lb. blocks and 4-lb. Liks. Order some from your dealer today.

**Service and research are the extras in**

**STERLING FARM & FEED SALT**

**INTERNATIONAL SALT COMPANY • CLARKS SUMMIT, PA.**


days between the weights of 25 and 50 pounds and again between 100 and 125 pounds is good.

### Thyroprotein

Thyroprotein is fed to alter the metabolism of hogs. It boosts the colostrum and milk flow of the sow—enough to increase three- and five-week weaning weights by 7.6 and 11.5 percent respectively, in an Iowa State experiment. At the University of Nebraska, researchers found pigs nursing sows on thyroprotein were about three pounds heavier at three weeks of age than litters of sows without thyroprotein. Pig losses were 13.3 percent lower.

Feeding thyroprotein to lactating sows needs careful management. The level—100 milligrams per pound of feed—is critical. Thyroprotein feeding must be in a high-energy ration. Sows must be on full feed from a few days before farrowing right up to weaning. They must have free access to plenty of water for the same reason that a cow can't produce milk to capacity without it.

Thyroprotein must be fed throughout lactation. The thyroid gland, which normally stimulates milk flow, takes a rest when thyroprotein takes over. Milk flow will take a real flop when thyroprotein is withdrawn. It is desirable to quit feeding thyroprotein at weaning. Sows dry up fast.

There is some evidence that thyroprotein in growing and finishing rations may be worthwhile. In a Purdue University experiment weanling pigs fed 60 milligrams of thyroprotein per pound of feed gained an extra 41 pounds, using 11 less pounds of feed per pound of gain than pigs not on thyroprotein. Thyroprotein-fed pigs, however, had more backfat, 2.40 inches of backfat versus 2.17 for pigs not fed this additive.

However, there is a lot of controversy on the feeding of thyroprotein. The majority of researchers won't recommend its use.

### Enzymes

Two types of enzymes are commonly fed to pigs. One type is proteolytic, meaning that it breaks down protein. Examples are trypsin and pepsin. The other type is amylolitic; it works on carbohydrates. This includes amylase, maltase, lactase and sucrase.

The graph at the bottom of page 55 shows the enzymes necessary to convert feed to a form useful to the body develop at different rates in the young pig. Lactase, which breaks down milk sugar, and amylase, which digests starch, develop early. The other enzymes aren't fully developed till about 6 weeks. Therefore, in a ration harder to digest than skim milk, enzymes help young pigs digest more feed, let them grow faster on less feed, and make them easier to wean early.

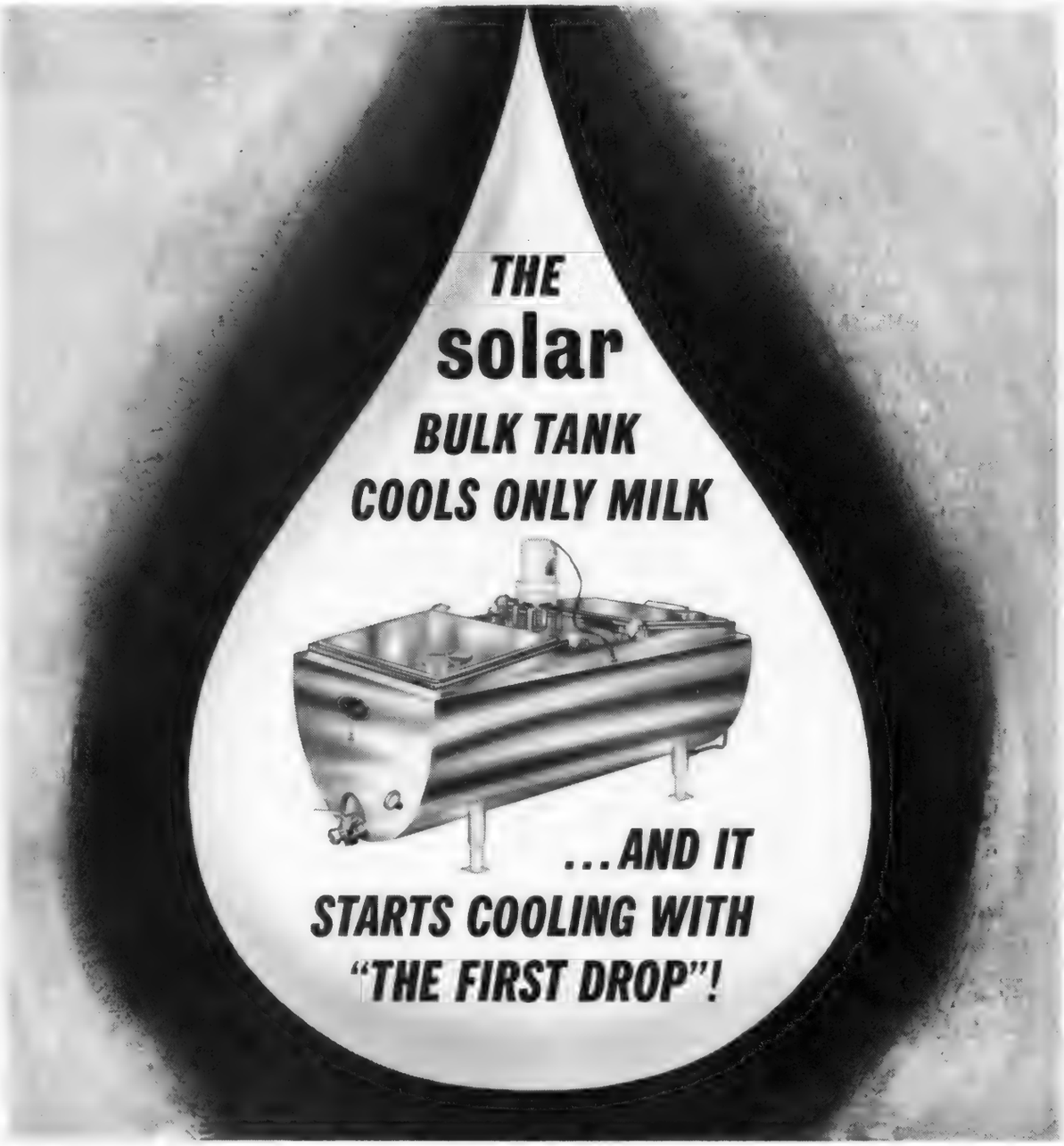
These benefits diminish with age. As the second chart on page 55 shows, enzymes are most effective in the starter and pre-starter rations, are sometimes fed in the grower ration, but have little effect on pigs over 50 pounds in weight.

Today manufacturers seldom produce a single enzyme for the commercial hog ration, but use an extract from fermentation of bacteria which contains several enzymes. This is the background of such label entries as "contains . . . a *B. subtilis* fermentation extract." *Subtilis* is the Latin name for the bacterium. The enzymes are another group of additives where considerable disagreement abounds. Many researchers discredit their use as sales gimmicks.

### Amino Acids

Amino acids are the building blocks of proteins and, therefore, part of the protein in the ration. Soybean oilmeal contains all the 8 or 10 amino acids a hog needs in the diet, although there may not be the amounts needed of each. Particularly for the baby pig, the ration could profitably be supplemented by a second source of protein, which may be in pure amino acid form. Lysine is the most common. But fishmeal or another protein source is usually a cheaper method to fill out amino acid needs.

When it's time to plan the menu for pigs few farmers find themselves equipped to mix ingredients to the milligram or to look up the detailed mixing regulations of the state and the nation. However, knowing which additives to look for on the feed labels can save him money at every stage of his herd's life.




What's more . . . you get efficient, low-cost operation from this precision-engineered, all stainless steel tank that's built to last! Solar is a direct expansion unit. This means that you start cooling milk the second it hits the tank. With Solar, you need not cool air, water or layers of metal first . . . there is never any wait for ice to build . . . full cooling capacity is available at all times. Solar's "power saving", controlled flow expansion plus the largest effective cooling area of any tank made, combine to cool more milk—faster—and, at less cost to you. Here's something else . . . only Solar gives you the program that completely spells out in writing the extra values of financing, servicing and warranties that can be yours. Before you buy, write direct or get the full story from your Solar Dealer on the bulk milk tank that COOLS CHEAPER!

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Tomahawk, Wis. Division of U.S. Industries, Inc.

*Better Milking Equipment . . . For Better Farm Living*

# "We're feeding for profit...and Stilbosol helps us make it"

***"We discovered that we have to feed Stilbosol if we're going to compete," reports Stanley Hurst, Manilla, Indiana***

"We started feeding Stilbosol when it first came out. Oh, about six or seven years ago. We quit feeding it for most of 1960. Well, we're back to feeding it again. You've got to if you're going to compete.

"What do I mean by compete? Well, to stay in this business, you've got to produce as economical as possible. We're feeding for profit . . . and Stilbosol in our ration helps us make that profit.

"We're feeding 100 head right now. 92 heifers and 8 steers. From our past records, we figure we get about ½ pound extra daily gain when we feed Stilbosol. That's for both steers and heifers.

"We feed to low choice and choice, and our cattle never have any trouble making those grades. We usually market our steers when they weigh 950 to 1000 pounds and our heifers when they reach 850 to 900 pounds.

"Seems like competition is getting tougher in everything you do. Last year I won the 5-Acre Corn Contest with an average of 141 bushels per acre. This year I had 153 bushels per acre and came in fifth," Stanley smiled.

**After seven years, Stilbosol continues to give feeders an extra 15% gain on 10% less feed.**

**Stilbosol®**

**(diethylstilbestrol premix)**

**ELANCO**

**Makers of HYGROMIX® (*S. hygroscopicus* fermentation products)**

**ELANCO PRODUCTS COMPANY • A DIVISION OF ELI LILLY AND COMPANY • INDIANAPOLIS 6, INDIANA**

### DIVERSIFICATION SAVED US

(*Continued from page* 52)

Montana winters, are raised in an open calf shed which has individual pens for a dozen calves. After a few weeks on milk replacer, they are turned together in a larger enclosure. The dairy heifers go to grass in the summer with the beef heifers, and are bred at about 18 months of age.

The bull calves are cut and, after weaning, put on self-feeders on a ration of equal parts by weight of barley, beet pulp, oats and corn to which soybean meal is added at 100 pounds per ton. "Holstein steers walk too much to get fat on range," Don observed.

The unique angle in the Williams and Tavenner dairy is the milk truck. This is a 400-gallon stainless steel tank on a small truck chassis. Every day it makes its ten-mile round trip to the Deer Lodge Creamery.

It is the Tavenner theory that the local milk processors and supermarkets make their milk profits at the expense of the producers and that this is accomplished through the hauling rates.

"Our blend price on milk here in the middle of May is about $4.75," Don said, "and producers are paying at least 35 cents per hundred for hauling. Some are paying as high as 85 cents. A dime will cover our costs, and a lot of producers aren't much farther from the processors than we are. One of the big chain stores came to see us about selling to them, and we were about to make a deal with them. But they wouldn't let us haul our milk in our own truck. They wanted to pick up our milk and charge us the going rate. We didn't bite."

#### Enterprise Number Four

Hogs are commonplace on most ranches, but not in numbers that climb into the high hundreds. Montana imports over 300,000 hogs a year to provide chops and roasts and pigs' feet for its own people. The ranch already had feed-mixing equipment for the dairy and was close to ample supplies of cheap barley. These circumstances brought Williams and Tavenner into the hog business three years ago.

"We are able to hold our costs fairly low and with Montana hog production as slim as it is we don't have to feel we are hurting anybody's market," Don said.

Bill Heltborg, the W-T dairyman, also handles the hog department. Ten to twelve sows a month are farrowed in the ten-stall farrowing house. After the pigs are weaned they go to various outside feedlots. Here they are periodically weighed and sorted into uniform lots according to size.

The sows are fed a ration of barley and 32 percent protein supplement. The fattening pigs get barley (94 percent of the ration) meat meal, soybean meal, vitamins, and free choice minerals high in phosphorus.

All hogs (about 1,000 per year) are sold on the local markets at Butte, Helena or Missoula.

A real effort has been made to produce meat type hogs. Sows of a variety of breeds can be found in the lots but Yorkshires and

FREE FACTS

on How to Succeed in Modern Dairying with

REGISTERED GUERNSEYS

*— Today's Best Choice for Highest Net Income*

Adaptable, efficient Guernseys earn highest net income. Here are some of the reasons.

- *Guernseys* excel in the ability to convert hay, pasture, silage and grain into the world's finest milk.
- *Guernseys* fit today's modern dairying methods . . . this means more efficient use of labor, feed and space in the barn and at the feed rack.
- *Guernseys* produce the finest milk. Guernsey milk is always in demand by distributors because it has the highest solids-not-fat, also, the highest protein, Vitamin A and mineral content of any milk. Guernsey milk is world renowned for its delicious flavor and unique golden color . . . which assures consumer acceptance. Remember, distributors pay producers on the basis of total solids — *not on pounds of milk alone!*
- *Guernseys* are easily handled.
- *Guernseys* are the earliest maturing breed, bringing you profits sooner and returning higher lifetime income.

Add all these important *Guernsey Plus Factors* together and you'll see the reason why the Guernsey breed adds up to highest net dairy profits.

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FREE FACTS — write today

THE AMERICAN GUERNSEY CATTLE CLUB
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☐ Send FREE information on how to start a Guernsey Herd, and a copy of "Profitable Dairying."
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More pounds of beef per acre - Less cost per pound of gain

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**LABOR & TIME SAVING**—Ensiloader loads all types of ensilage at rates up to and exceeding 1500 lbs. per min.

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NEW BLUE BOY HIGH CLEARANCE TRACTOR

The new and larger 1961 Blue Boy has 12.5 or 18 horsepower Wisconsin air-cooled engine. Either manual starter or electric starter and lights from 12-volt system. Driver's seat and all controls turn with the front wheel. Wide variety of uses, including insecticide, defoliant and detasseling.

JOHN BLUE CO., INC.
HUNTSVILLE ALABAMA

Montana Number Ones predominate. Yorkshire and Montana Number One boars are alternated.

### Field Work

Grass is the foundation of the entire Williams and Tavenner empire and calls the tune for all the farm operations. About 2,400 acres are cropped in the mountain valleys and the object of the rotation is to get land back into high-producing meadows.

This is hard, high-cost farming; but the returns are high, too. Because of the lay of the land in the valleys and on the lower slopes the fields are small. Fifty acres is a big field; the average is probably under 30 acres. The cost of fencing alone, on irregular-shaped plots of this size, is significant. Most of the fields are peppered with glaciated boulders from baseball to medicine ball size. After a field is plowed the rocks are removed with a mechanical rock picker, which dumps them in a pile. A big Michigan loader scoops them into a dump truck to be hauled to a gully nearby.

After a working down with disk and harrow the fields are gone over with a land leveller or a landplane, for all crops are irrigated, and the surface must be conditioned for even distribution of water from the ditches on the upper side of the field.

As the seedlings send up their shoots irrigation starts. Only skillful handling prevents washing on the sloping fields. Finally, at harvest time the grain, hay or silage must be hauled for miles, in many instances, over rough ranch roads—and the bridges over the creeks and irrigation ditches had better be in top shape.

Of the 2,400 acres of cropland about 2,000 are in hay. There is straight alfalfa, or alfalfa mixed with brome grass, orchard grass, fescue and intermediate wheatgrass. Bluegrass also does well in the valleys but its yields are low. Three thousand tons of hay are put up on the ranch every summer, in about 30 days. This means 100 tons of hay per day every day the sun shines during the season, and demands almost continuous operation of three mowers, three balers and a high-speed stacking system.

The system consists of rickers dragged behind the balers and pickup heads mounted on a tractor loader and the big Michigan loader. It works like this: The rickers are metal frames one bale wide, two bales high and two bales long. The bales are fed from the baler into the ricker, and as the fourth bale slides in a trip is released, and the four bales are left sitting on the field in a neat package. The pickup head on the loader consists of four slots (eight on a supersized model Bob Tavenner engineered by putting together two heads). One four-bale package is picked up in each slot. Thus the loader can pick up 16 bales (32 on the big one) and stack them 10 bales high with practically no human effort.

Silage is also an important item in the ranch rations. Alfalfa, particularly during the June rains, is chopped into a huge Field Queen hydraulic trailer from which it is

ARE YOUR PIGS SITTING ON A KEG OF DYNAMITE?

A federal veterinarian recently described the national hog cholera situation as "ripe for a blow-up." Why? *Because the hog cholera vaccination rate is the lowest on record!* States have declared emergencies—banning shipments, slowing movements at auction barns and urging quarantine laws. So, don't wait! Vaccinate! **ANTRATE®-H.C.** is a concentrated blood globulin solution having at least *two times the potency* of anti-hog cholera serum. Because this is so, dosage is cut in half. This is particularly desirable when large doses are needed, as in the case of exposed pigs. Antrate-H.C. is especially well suited for use with Armovac-A to give a strong active immunity. **ARMOVAC®-A** is a safe modified live hog cholera vaccine successfully used throughout the U.S.A. since 1957. It works hand-in-hand with Antrate-H.C. to provide *a new concept in hog cholera immunization.*

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*The only safe pigs are vaccinated pigs.*
SEE YOUR VETERINARIAN NOW!

SPRAY Empty Bins NOW!
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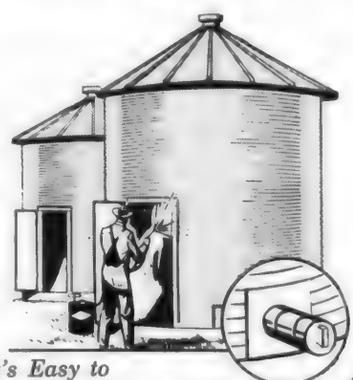
Early Cleanup ASSURES Clean Bins at Harvest



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*It's Easy to*
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## is GREATER HOURLY PRODUCTION!

**Specialized farm equipment saves valuable field time in a wide variety of crops...adds hours of production to crowded harvest days.**

THE HESSTON 240 WINDROWER-CONDITIONER
**SAVES 4 HOURS HAYING TIME EVERY 60 MINUTES**

The Hesston 240 Windrower-Conditioner offers 8 new dimensions to profits! It cuts, conditions, and windrows in one operation—five times faster than conventional tractor-mower, conditioner and rake. Saves 293 miles of field travel in every 100 acres. Requires less manpower and saves up to 50% on equipment costs. Gives you up to 23.4% dry weight yield increase and saves tender, nutritious tips and leaves. Versatile for use in small grains, peas, beans, seed crops, mint, lentils, and many other crops.

THE HESSTON NON-SLUGGING STRAW CHOPPER
**SAVES UP TO 24 HOURS DISKING IN 100 ACRES**

The Hesston Straw Chopper on your combine whips your heavy-straw, tough-stalk problem as you harvest. Free-swinging hammers shred residue as it leaves your combine into easy-to-plow-under lengths . . . spreads them evenly over the field. Eliminates bunching . . . makes plowing easier . . . saves one or two diskings. Hesston-shredded straw decomposes quickly, returns nitrogen to soil, improves humus, helps soil retain moisture and resist erosion. Ideally suited for wheat, oats, soybeans, rice, barley, flax, lespedeza, and many other crops. Available for most combines.

THE HESSTON CORN HARVESTER
**CUT, SHELL, SHRED, SPREAD 4 ROWS AT A TIME!**

The most efficient corn harvesting attachment available! Cuts four rows at a time. Corn is shelled **inside** combine eliminating grain losses common with dangerous snapper-roll types. Stalks, leaves, and cobs are shred and spread evenly over the field . . . leaves the field clean, ready for plowing. Also lets you combine soybeans, milo-maize, millet, and other crops without changing headers. Priced at only ½ the cost of other corn head attachments. Available in two-, three-, or four-row units for your favorite combine.

*there's nothing like a Hesston!*

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Bazooka

Automatic
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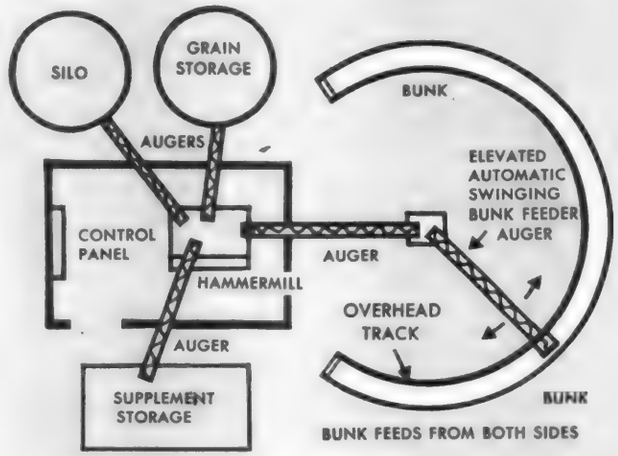


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## Now You Can Install and Operate An Automatic Bunk for $\frac{1}{3}$ to $\frac{1}{2}$ Less

Here is real savings in the newest idea in bunk feeding—a circular-type bunk that feeds from 225 to 450 head of cattle with just ONE 50-foot Bazooka Auger. This one 50-foot auger can fill up to 225 feet of bunk. It also saves you money in operation, because it uses smaller H.P. motors than comparable straight-line bunk feeders. This is truly the ultimate in automation and economy.

Start small and add-on feeding capacity without large expense, simply extend the feed bunk and overhead track. No more auger or motor to buy! You easily stay within rural electrification power limits.

The Bazooka swinging auger automatically distributes feed evenly in the bunk, **without feed separation.** All moving parts are elevated for safety. Flexible feed spout cannot injure cattle in any way.

**ask your Bazooka man**

WYATT

See your Bazooka Dealer or write today for detailed information on Bazooka's new Circular Bunk Auger System.

**THE WYATT MANUFACTURING CO., INC.**
**505 NORTH 5th ST., SALINA, KANSAS**

transferred to dump trucks and stashed away in trench silos. Oats silage is also put up, and 85 acres of corn yields around 20 tons of silage per acre.

The corn is something of an innovation on the ranch. The Montana summers are too short to raise corn for grain, but, planted in 38-inch rows, with seeds only 3½ inches apart in the row, the crop turns off excellent silage. The corn is planted around May 20; harvest starts the last week in August.

Corn has taken the place of potatoes in the rotation. This rotation now consists of a stand of oats the year after the sod is broken, followed by two years of corn and back to hay with a nurse crop of oats. Much of the hayland is also reseeded with a pasture renovator.

The area is phosphorus deficient, so large doses of phosphorus are applied, particularly on land with a history of legume production. Triple superphosphate was applied to some of the alfalfa land this spring at 240 pounds per acre. One hundred and sixty pounds per acre went on with the corn at planting time, as well as 100 pounds per acre of 33 percent nitrogen at the last cultivation.

### Inflation and Taxes

This, in outline, is the way one large Montana ranch has kept rolling in recent years. Have the returns measured up to the effort? The answer is—the place is for sale.

"Our corporation is capitalized at a million and a half dollars," Don said, explaining the reason. "If we were to put that money into bonds our returns would be doubled—and without risk.

"We know how to produce. The really serious problems are increasing costs, declining prices, inflation and taxes. We've cut our costs to the bone and chopped off the frills. We've taken advantage of the economies of size and adopted the newest techniques. But we're still at the mercy of poor markets.

"Take the tax situation," Don said. "Our real estate taxes alone have doubled on this place since we split with Sylvan Pauly twelve years ago. Income taxes take a big cut. And the estate and inheritance taxes are the thing that really makes you stop and think. What would happen if one of us were suddenly to die? Despite the fact the government now allows a period of years for the settlement, the ranch would still have to be sold and at a forced sale it would never bring anything like what it is worth.

"And then there's inflation. Twelve years ago we made a very realistic appraisal of all of our land. Our best grazing land at that time was worth around $8 to $10 an acre. Today the same kind of land is selling for $40. The way things are going in Washington I'd say this is only the beginning. The tough part of it is, that the only way you can cash in on these inflated values is by selling out. If we sell, our capital gains will be taxed at only 25 percent. But again, it looks like the present administration is getting pretty serious about eliminating the capital gains provisions.

"The talk for years has been that every enterprise must grow bigger and bigger. And we have. We've expanded into fields we never dreamed of years ago. But there's a limit. Now we're at a size where we wonder if it would really be fair to turn it over to our children. You don't learn how to run a thing like this in college.

"This is a pattern we see all over the range country. Tax laws and economic conditions are making ranching a gimmick for those with an outside income. The Pauly place is for sale, too. In fact, we're both listed with the same broker. Someone with tremendous capital will probably buy these two places and put them back together, set up advantageous depreciation schedules, balance their losses against tax savings and in a few years they'll sell out to a fellow ledger juggler. These people aren't ranchers. They may never see the place. But today ranching is a business, not a way of life."

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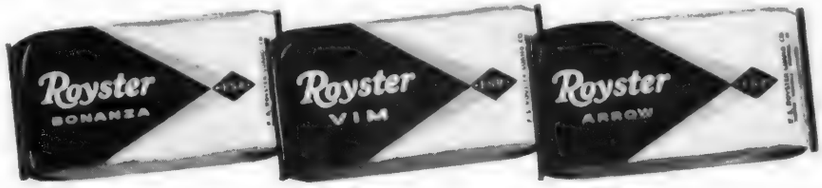
3. Follow simple, good rules of successful farming—crop practices recommended and proved in your particular area.

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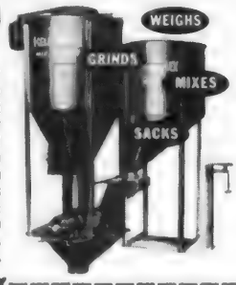


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## SUMMER CROPS, WINTER LIVESTOCK

(*Continued from page* 69)

increases efficiency of all field operations, including harvesting, by about 20 percent.

By August, when the new corn prospects begin to emerge, Jones and Morgan lay their cattle-feeding plans. Everything depends on their production costs. Last winter it cost them $21.50 to put 100 pounds on a steer. This varied somewhat with the grade. Morgan makes up a chart (the one on page 140 was used in 1960) of the limits of their bids for feeders at each grade and weight. If they cannot be bought within these limits, he does not buy. He buys, if possible, the cheapest grade and weight on the chart, which allows the same profit for all cattle. As an example, $20 a hundred looked like a good price for 800-pound steers of High Good grade. This was arrived at by estimating the selling price and deducting costs and profit expected. The partners vary their bids as the market and their costs change.

Morgan's biggest responsibility is buying the cattle. They are purchased from within a 500-mile radius. "Beyond that," he said, "the freight charges put us at a disadvantage." Morgan spends a week looking over feeders at farms and sales, flying to St. Paul or Fargo, or to Kansas City, or to sales in Alabama and Mississippi. He returns home to decide on the best source of the grade of cattle that interests him, and returns to bid. He buys 1,100 to 1,200 each fall and winter.

Morgan and Jones purchase whatever cattle they feel will make the most profit. They feed steers of all grades from Utility to Medium Choice, but nothing lighter than 750 pounds. The lower grade dairy breeds are put on short feeds. The better the grade, the longer the feeding period.

Morgan is a plunger. He buys grades and weights that scare other buyers. Typical of his attitude is this comment: "Last fall some of the bankers said heavy cattle looked bad for 1961. Some bankers wouldn't loan a cent on heavy feeders. So they were quoted at a good price and we bought them and sold them before the break this spring. When we see a trend, we go opposite. It has shown a profit most of the time."

The silo is often opened a few days after it is filled, for the cattle begin to come in early. They are given access to full feed the minute they leave the trucks. Morgan advises, "I have often bought cattle on Monday and phoned home to have the feedbunks filled for their arrival Tuesday."

The steers are fed in two 25-acre lots with adjoining fenceline feedbunks on the contour of a small, sloping hillside. One feedbunk is 650 feet long, the other 550 feet. The cattle have no shelter other than the natural windbreaks offered by brush, timber and rugged terrain. These lots are part of a small farm, 1½ miles from the main operation, bought by Jones years ago primarily for a feedlot. He knew the slope and sandy soil would offer good drainage. "At home cattle would sink in up to their

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bellies," said Jones. In 10 years the lots have never been cleaned. "The manure is not worth the expense of loading it," Jones feels.

Morgan contends that "all feeder cattle are wormy." As soon as new steers become accustomed to the place they are wormed with phenothiazine in the feed at one pound for seven head of 800-pound steers. This is repeated in two or three weeks. "You can quickly see a change in their eyes, their hair coats and their appetites," Morgan says.

The Jones-Morgan place is a combination of five farms. Corn is stored in widely scattered cribs, and the livestock lots are far apart. Feed is ground every day but Sunday, with a double grind on Saturday. Instead of centralized grinding, the partners have devised a portable system. Corn is elevated into a truck-mounted grinder designed by Morgan. It consists of a Helix feedbox with a traveling apron which delivers the load to a side-mounted burr mill. "Hammermills make the feed too dusty for good digestion by cattle," Morgan believes. The 300-bushel per hour grinder has 16 speeds and is powered by the truck motor.

The grinder truck is used to process feed for the hogs and cattle. Feed ingredients are loaded into the truckbox in layers. They come off the apron sufficiently mixed. A blower attachment is added when self-feeders are to be filled. From a tank mounted under the truck bed, molasses can be metered on the corn as it is ground.

The grinder truck, of course, cannot be used for silage. As the cattle and the pregnant gilts are fed concentrates in the silage, their feeds are processed differently. The grinder truck delivers ground ear corn to a holding tank. From there it is mixed with silage and transported to feeding areas in a second truck unit.

The holding tank consists of a 700-bushel Butler tank near the main crib storage. When husks in the ground corn slowed down the flow from the bulk tank, Morgan's ingenuity came to the rescue. He cut apart an old combine and set up the tail end, motor driven, to act as a separator when filling. Ground corn from the grinder truck empties onto the shaker screens of the combine. The screened, ground corn is elevated into the bulk tank. The husks fall to the ground and are carted away. The plan is to have them conveyed into a dump wagon. "Husks make the best hog bedding you can get; they are more absorbent than straw," Morgan has found.

For feeding cattle and pregnant gilts, supplement is loaded into a second, portable unit, a Davis Transit Mixer. This heavy-duty outfit holds 8,000 pounds. The supplement-loaded rig is driven under the bulk tank where ground corn is added. The bulk tank delivers 7½ bushels a minute. By setting a timer, the right amount of corn can be added. Next, molasses is added while the load is being blended by giant paddles. Finally, the truck is driven to the trench silo where silage completes the load. The mixture is augered into the fenceline feeders.

Molasses is kept in a 4,000-gallon tank. Engineers advised that the entire tank

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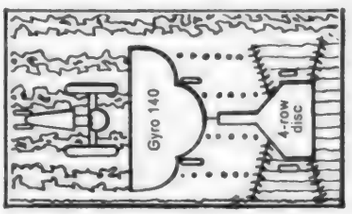


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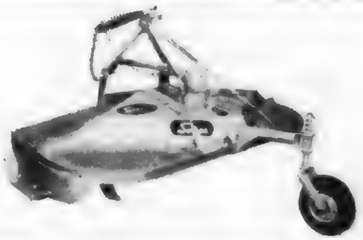

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- ☐ Lone Star Blade (light 6')
- ☐ 3-Way Ditcher-Terracer Blade, 6'
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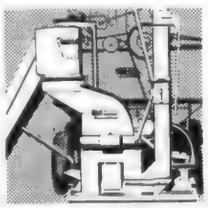

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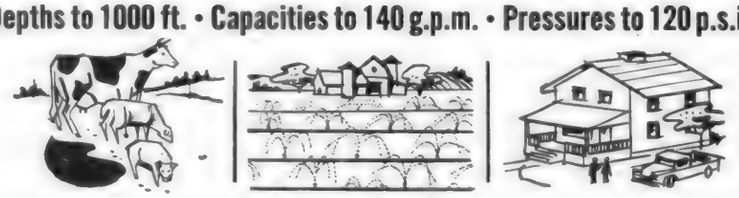

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would have to be heated for the molasses to flow in cold weather. Morgan thought otherwise. He added a six-inch pipe outlet to the tank, leading to an adjoining insulated shack. Inside the latter is a 60-gallon tank. This small tank is heated by an infrared gas heater at a cost of $36 per season.

Morgan, like his partner, is a firm believer in silage for fattening cattle. He doesn't want mere tonnage. "It has to have nutrients," he insists. "I want a short-stalked variety with more feed value. I want it to be good. With ear corn at 90 cents a bushel, silage isn't the bargain farmers used to believe. Our costs are carefully worked out. It costs us $5.60 to produce a ton of silage. Our yield is about 20 tons per acre, or $112 per acre in total costs. At 20 percent TDN, there are 8,000 pounds of TDN in the 20 tons. So 8,000 into $112 gives 1.4 cents a pound as our digestible nutrient cost.

"A yield of 100 bushels or 7,000 pounds of ear corn per acre, times 73 percent TDN found in ear corn, gives 5,110 pounds TDN per acre. Our 69 cents-a-bushel production costs, or $69 an acre, divided by 5,110, gives a cost of 1.35 cents per pound of digestible nutrients in ear corn."

The present trench silo was made from two parallel trenches 40 feet apart. The dirt between them was scooped out for 70 feet, making the silo 92 feet wide at the opening, but divided into two 26-foot trenches farther back.

"We never like to run out of silage," Morgan says. "We try to clean out one side a year, leaving some two-year silage."

The 140 or so winter gilts are also fed silage, delivered to their fenceline feed floor by the Davis Transit Mixer. They receive 12 pounds per head daily. Mixed in it are 1 pound of molasses and 1½ pounds of 32 percent supplement. Jones observes, "Unlike cattle, swine can suck out the protein and molasses and spit out the fiber. They mess around in it, and they waste some. But silage is a great conditioner for gilts. I am confident that feeding silage after breeding produces larger litters. In years when we began silage feeding late, the gilts which were on silage the longest had the largest litters and the largest pigs.

"We've been using a one-litter gilt system for seven years," Jones continues. The gilts, sold after farrowing and weaning one litter, bring top market prices. Listing the gilts as breeding stock makes for a considerable tax saving. "Feed efficiency is better with a gilt," Jones feels. "Treat her right and she'll do you as good as an old sow. But our main reason for a one-litter gilt program was to ease the labor problem. Year-round farrowings took too much labor away from summer crops."

The partners have worked out precise breeding methods. Their object is to farrow 16 gilts every two weeks, from December 1 to April 1. To accomplish this, they figure 21 gilts must be covered to assure 16 pregnancies. Hamp, Berk and Poland China boars are alternated from one year to the next. Gilts of mixed breeding are saved for the following season. The boars,

8 for each 60 females, are allowed in the gilt pen for one hour a day. They are closely watched. Breeding dates are recorded for each gilt. When 21 have been served, the boars are isolated for the remainder of that two-week period. Then the cycle begins again. With 16 gilts farrowing in any two-week period the space in the farrowing house is sufficient.

There are 16 farrowing crates in the specially-constructed, well-insulated building. It is adequate, but of common construction. "We never make a capital investment that can't pay for itself in five years," Morgan says. The concrete floor slopes to the center, at one inch to the foot. Floor drains are centered. Sows face out.

The crates are floored with planks raised 10 inches off the concrete, allowing liquids to drain away. Corncob litter is used. Manure can easily be raked from the planks for collection. The gilts are self-fed a ration from a small hopper in each crate.

The house is kept at a constant 55 degrees with gas-fired, forced-air ceiling heaters. A heat lamp is turned on the day farrowing is expected and turned off the third morning afterward.

Ordinarily no attention is given the gilts at night. In the morning, the crates are cleaned. Each new pig is given a shot of antibiotics and its navel is sprayed with iodine. Iron shots are given the third day, and a heavier ration is fed the gilts. At 10 days, ears are notched, and the males are castrated. After 14 days in the crates the gilts and litters are transferred to a nearby nursery lot—four litters to a lot. Each lot has a low shelter with loafing areas for the gilts, bedded with cornhusks, and a 8 x 10-foot boxed-in creep, bedded with crushed cobs and warmed by heat lamps. Pig pellets are always available in the creep. Outside the shelter is a large self-feeder for the gilts.

The pigs are weaned at seven weeks. At eight weeks they are vaccinated, and at nine weeks moved to fattening lots. The gilts are marketed as soon as they are in good flesh. Last year's record showed 9.3 pigs born alive and 8.25 pigs sold per sow. About 80 percent of the market hogs grade Number 1 meat type.

Jones and Morgan have standby equipment for most emergencies. An old Farmhand feed truck is useful when breakdowns disable the other feed trucks. A scoop left mounted on an old tractor goes into action if the new silage loader fails. An old baler and combine are kept to harvest the grain and straw from the resting hoglots which are seeded to wheat or rye. The partners believe in being ready for any emergency. All the workers have at least some mechanical experience, and they all jump in to help when repairs are needed. They are all trained to handle any of the equipment so sickness or days off will not slow production. Every man has a stake in the operation.

*(On the following page is an example of Ralph Morgan's calculator for buying feeders.)*


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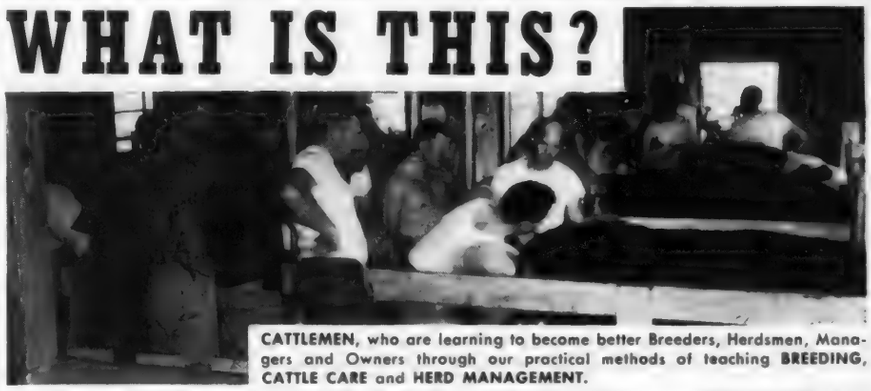

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# People and Pesticides

To turn out good products, a chemical company needs good chemists and chemical engineers. But that's not enough for a chemical company in the pesticide business like Niagara Chemical Division of Food Machinery and Chemical Corporation. In addition to chemical experts, you need a whole team of agricultural scientists–plant pathologists, botanists, biologists, horticulturists, practical field service men, and, of course, men who know all about the insects growers must control.

Paul Lippold, a research entomologist, is on Niagara's team of agricultural specialists. At the Middleport research laboratories, he is responsible for testing and evaluating new insecticides and miticides against a variety of crop pests. To help him in his work, he has four laboratory technicians who carry out the tests he outlines. He analyzes these results continually–consulting with other members of the staff as he goes along–until he has sufficient data to determine the insecticidal activity of a particular material.

Niagara Research Entomologist Paul Lippold

Paul's report to Niagara's supervisor of biological testing, Dr. Kenneth Dorschner, is weighed along with others on a material's toxicity to animals and plants. On the basis of all this information, a decision of the material's immediate future is made. It may be approved for further field testing or dropped as not sufficiently promising; or modifications in formulation or chemical structure recommended to improve effectiveness.

The screening process varies little from day to day but there is some seasonal variation in Paul's job. When the growing season comes, he moves into the field, testing promising new materials under actual environmental conditions.

Paul's interest in insects, plants and agriculture goes back to his boyhood summers spent on a Michigan farm. A native of Aurora, Illinois, he earned his B.S. and M.S. at the University of Illinois in biology and general science teaching, and after working for several years, returned for his Ph.D. in entomology. His doctoral work was on attractants–naturally occurring plant substances that attract certain insects to specific plants.

At Niagara since 1956, Paul has worked on the development of Tedion® miticide, ethion miticide-insecticide and Thiodan® insecticide from the early stages. He's proud of the job these now commercial products are doing in the field, and is looking forward to the completion of Niagara's new research laboratory under construction in Middleport–"so we can test more compounds more efficiently."

Paul's wife Anne, who has an M.S. in biology, shares his professional interests. Fittingly, they met in a college entomology course. The Lippolds live in Lyndonville, N. Y. with their three young children. An enthusiastic gardener at home, Paul has one acre devoted to trees and shrubs, another to formal flower gardens.

In Paul's opinion, the cotton boll weevil is our biggest insect problem. Mites and aphids are close runners-up, with resistance, particularly in mites, an increasing concern. "We've got to keep looking for new compounds or synergists to make the old ones work better against pests," he says.

Niagara's business is built on dedicated people like Paul Lippold . . . and the pesticides developed through the coordinated application of their many professional skills. They are the key to our success in helping you grow pest-free crops . . . and our success next year depends on your success this year.

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**Morgan's System for Buying Feeder Cattle**

| | | Weight When Purchased | | | |
|---|---|---|---|---|---|
| Finished Grade | Numerical Grade | 750 pounds | 800 pounds | 850 pounds | 900 pounds |
| High Utility | 3 | $11.50 | $13.50 | $13.50 | $13.90 |
| Low Standard | 4 | $13.00 | $14.25 | $14.50 | $15.00 |
| Medium Standard | 5 | $13.60 | $15.50 | $15.25 | $15.50 |
| High Standard | 6 | $15.10 | $16.67 | $16.50 | $16.35 |
| Low Good | 7 | $16.50 | $18.00 | $18.10 | $17.30 |
| Medium Good | 8 | $18.00 | $19.35 | $19.00 | $18.20 |
| High Good | 9 | $18.75 | $20.06 | $20.10 | $18.75 |
| Low Choice | 10 | $19.45 | $20.60 | $20.60 | $19.30 |
| High Choice | 11 | $20.20 | $21.30 | $20.90 | $20.00 |

This is the card chart Ralph Morgan carried with him in the fall of 1960. It is revised as costs and estimated selling prices vary. The prices are Morgan's maximum bids at the point of purchase.

He estimates the probable selling price of the finished animal. This, with the final weight, gives him the total return per head. From this, he deducts his freight and feeding costs and the profit for which he is aiming. The remainder he divides by the weight of the feeder, to arrive at his maximum bid per hundredweight.

For example—

| | |
|---|---|
| Selling Price High Good Slaughter Steers | $23.50 |
| Purchase Weight of Steers | 800 lbs. |
| Gain per Day | 2.4 |
| Days on Feed | 125 |
| Finished Weight | 1,100 lbs. |
| Return: 1100 lbs. at $23.50 | $258.50 |
| Less Costs: Shipping in and out, feed, etc., and projected profit | 98.00 |
| Maximum Purchase Price per head | $160.50 |
| Maximum Purchase Price per cwt. (800 lbs.) | 20.06 |


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MacKISSIC EQUIPMENT
For Grinding, Mixing and Delivering Feed

PTO—Engine—Electric Motor Powered Models
Available in Mobile and Stationary Units
*Write today for full information on these MacKISSIC models*
The A. E. MacKISSIC CO. — Parker Ford, Pennsylvania

## GRAIN HEAD SILAGE

(*Continued from page* 90)

reach maximum dry weight. But grain at this moisture content —around 45 percent—cannot be threshed or picked well, and soft grain silage makes a handy solution.

"You take the top of the plant for the silage, and leave the rest in the field, either to be grazed or plowed down. Corn is cut just below the ear, about 34 inches from the ground, leaving about 25 percent of the total weight of the plant in the field as stump. To harvest milo at 75 percent grain we cut at about 30 inches from the ground, or 6 inches below the head. Oats we cut about 6 to 8 inches below the head. Remember, many crops grow higher here. The height of cut varies a little in different areas."

With oats and milo, double cropping is possible in the South and West. At the Delta Branch Station, Hogg and James Collins have taken winter oats and milo, and milo after milo in a single season. The double crop of milo matures in about 180 days.

The procedure with oats is to harvest the winter-planted crop as the grain reaches the dough stage. This is mid-May in Mississippi, later farther north. The system will work as far north as central Kentucky. Immediately after harvesting oats the stubble is chopped and spread on the field, or harvested as a low-grade silage. Then the field is plowed and reseeded to a locally adapted milo. The Delta Branch workers used DeKalb E 56a and DeKalb D 50a. The second crop must be fertilized as heavily as the first. In 90 to 100 days it is ready to harvest. Milo is ready to cut for head silage when the grain is in the dough stage, the stage of maximum dry matter. If pinched, no milk runs out.

For a double crop of milo, the first crop is planted as normal in the spring. It is harvested at the dough stage. The next step is to cultivate to get rid of grass and weeds between the rows. Then the stubble is cut back with a mower or windrower or forage harvester to four inches. The crop is fertilized as heavily as the first growth, 80 to 100 pounds of actual nitrogen, and potash and phosphate as needed. (The rich soils of the Delta region need neither P nor K.) Lastly, irrigation is used where available and


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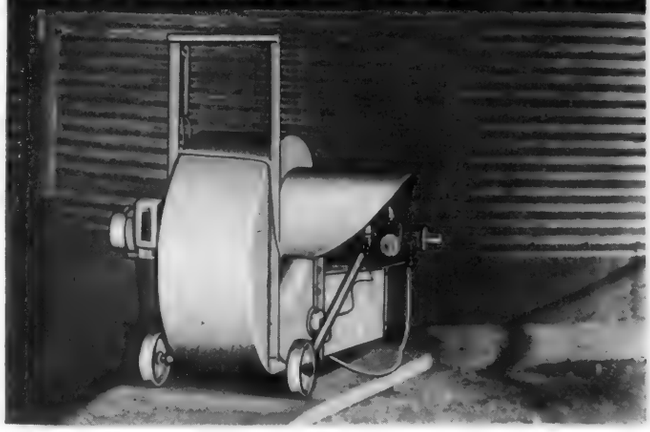

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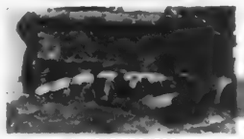

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You ought to see the COMET POWER SCYTHE in action. You'll like its perfect balance which makes operation so easy. And, you'll thrill to the performance of the sturdy 2½ h.p. Clinton engine.

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necessary. This ratoon crop, or second growth from the same plant, matures to the head silage stage slightly faster than the first crop, and yields just as well, but only if properly fertilized. The ratoon crop grown by Dr. Hogg matured in 80 days.

The stubble must be cut back to get uniform regrowth. If the stalk is left, heads sprout from each leaf node, and a series of heads appear at different heights, maturing at different times down the stalk. Insects are more of a problem, as they can follow their life cycles in the different stages of milo head. And there is no uniform maturity date for harvest.

There are variations on the basic double cropping theme that would extend the double crop as far north as southern Missouri or Illinois. A crop of oats planted in winter or spring could be grazed off in May, milo planted in June. The milo should mature in 100 days and be harvested by the end of September. It might be possible to get a crop of oats as head silage, and push the milo season to July-October; it all depends on first frost.

### The Machinery for Harvest

The tools for producing head silage are conventional until harvest. But no machinery now built will cut a crop at 30 to 36 inches high and chop and blow it into a wagon.

Dr. Hogg's answer was to add a false axle two feet below the regular axle on a Gehl forage harvester. This raised the cutting height from the normal 6 to 12 inches to 30 or 36 inches. The lift came from two plates, bolted where the regular axle fits, and drilled with holes so the false axle could be adjusted to cutting heights from about one foot to three feet.

The brothers Segrest tried this solution the first two years, but last winter they bought (for a song) a combine which had digested a fence post, and which, therefore, had a pretty severe stomach ache. They stripped the machine of all the works behind the header bar and its elevator. Then they mounted an IHC 20c forage chopper on the rear of the combine chassis, feeding it with a chain conveyor from the header. They left the existing engine on the combine, to drive only the cutter bar and the forward motion of the machine. The height of cut is hydraulically controlled, and needed little or no modification.

"I believe it'll save two tractors, and handle 40 to 50 acres of milo a day," said Shelton Segrest. "You can open up a field with it right now, without the wasted rows you have with a trailed machine."

### Feeding Head Silage

Another Segrest explained what attracted them to head silage. "Ten years ago, the idea was to go out in the field and get the biggest volume of silage you could. Now, we've come to an entirely new idea—bringing back just the right nutrient ration for the cattle or hogs," said John Segrest, younger brother of Shelton, and in charge of the Segrest hog operation. (The other brothers are Jeff, John's twin; and Thomas, the youngest, who runs the large Segrest logging operation. The father is T. J. Segrest, a very active 72.)

"We're going to build a tilt-up concrete bunker silo for 250 tons of head silage for the sows and boars, right next to the farrowing sheds. We've got 250 sows; they'll get head silage on concrete during farrowing and nursing, and the rest of the time they will be out grazing. We feed a pound of supplement a day, and the way they eat the head silage is something. If there's a fault, it's that we find we're getting our sows and boars too fat on it."

But most of the 2,600 tons of head silage made on the Segrest farm goes to feeder cattle during the 50 to 90 days in winter when the cattle can't graze. "We're a grazing farm," explained Shelton. "We can grow a crop of grass 10 years out of 10. Although we get 50 to 60 inches of rain here, drouth comes at just the wrong time for corn. That's why we like milo.

"We buy cattle that will make Good and Choice, around 400 pounds, about 2,000 of them a year, and they leave us weighing around 750. Everything gets onto pasture. But when the grass is not growing, we feed head silage and two pounds of supplement a day, and they really grow. Some of them come out of that lot fat.

"They start in the lot in the latter part of November, and stay there into February. We get head silage out with an Oswalt Ensiloader and use auger wagons to fill the bunks. As the pastures get better we push more cattle out from the lot."

TALK OF THE TOWN —
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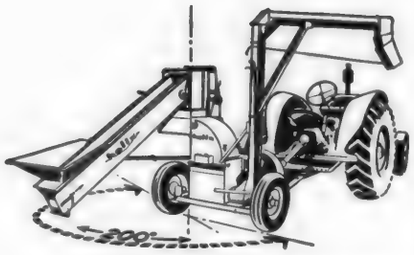
# HELIX-FIRST DUSTLESS HAMMERMILL



Elevator swivels more than half circle (200 degrees); raises to 24" off the ground. Manual loading controls are within easy reach of operator. One man can do the whole job—grind out of several bins or wagons without re-setting.

**Grinds twice as fast as most burr mills—up to 450 bushels of ear corn per hour!**

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Helix Hammermill handles Purdue-recommended chunked high-moisture ear corn* —grinds to any feed size—and keeps ahead of two 2-row pickers. Have your dealer show you what the big-capacity Helix Hammermill can do—on your own place. It's also available in combination with the new Helix Grinder-Mixer that grinds, mixes, blends, unloads *2 tons of feed in 20 minutes!*

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| *Fast Growing*—grown from selected seed. | | |
| 2-yr., S., 5 to 10 ins. | $7.00 | $35.00 |
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*All 3-yr. and 4-yr. Seedlings are root pruned before previous growing season.*

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**MUSSER FORESTS** Box 6-H INDIANA, PA.


The Segrests grow just one crop of milo, planting 7 to 8 pounds an acre of DeKalb E 56a, Pfister 515-S or Texas 610 around June 1 to 10, using 225 pounds per acre of 6-24-24, and sidedressing with 60 to 80 pounds of actual nitrogen. They harvest 90 to 95 days later. They planted 640 acres last year, filling the silos first, combining the remainder for hog feed.

"We could get a second crop in 80 days," said Shelton, "but we want to start our grass mixture after the first cut of milo."

The "grass," planted every year, is a mixture of 30 pounds rye grass, 2½ bushels oats, 40 pounds wheat and six pounds crimson clover. It costs $30 an acre for complete planting, including 60 pounds of nitrogen and 40 of phosphate plowed down, and 30 to 60 pounds of nitrogen again in April.

### No Foundering

Starting cattle on feed using the high grain head silage is a breeze. "The dumbest feeder in the world can't founder one," said Shelton Segrest. Dr. Hogg confirmed the opinion. "All our feeding trials have shown how fast cattle can go onto full feed using this silage," he said. "And cattle on head silage show a marked advantage in rate of gain over cattle on dry grain, especially the first 40 days on feed. There's no delay while they get on feed.

"You see," continued Hogg, "we're providing exactly the right type of grain and roughage mixture for the stock. With corn, oats or milo, the grain percentage can be varied to suit dairy cattle, beef cattle or hogs. We may even be able to fatten hogs on high grain milo silage, especially if it's cut right under the head to keep the roughage down to 20 percent of the dry matter. That would be a real advance because of the problems of combining dry milo.

"You may ask about leaving the stalk in the field. Well, the digestibility of that stump is a matter of opinion, I suppose. But I do know that cattle will graze the leaves off first if you turn them into a field, and if you force them to eat the stumps their production'll drop.

"It may be we should grind the milo in the head silage for both cattle and hogs. It's simple to pass the silage over a grating that separates the grain, and pass it through a mill to crack it. Then remix the grain and roughage, and you have a feed as efficient as corn. Our cattle-feeding trials showed the soft-grain silages as good as ground ear corn in rates of gain per day, with better feed conversion. We wanted to harvest and feed as much roughage with the grain as possible, without reducing the daily gains."

The South today is the nation's fastest growing cattle-producing area. If the system designed by Hogg and proved by Segrest takes hold as it might, the southern cattle program could move even faster—because it has found a chink in the armor of the Corn Belt. The South has a grain crop of its own.

# Compare Farmhand's new F-40 with any other low-cost feeder!

**OR WITH ANY FEEDER!** Compare it feature for feature, price for price and see how much more Farmhand gives you for your money. The new F-40 is a rugged, feed-tight, grain-tight mixer-feeder with reversible apron for front *and* rear unloading.

You can heap the F-40 high with 181 bushels (293 bu. with side extensions), mix and unload out front cross-conveyor system; two-speed apron empties entire load in one or three minutes. Or you can unload corn and small hay bales out rear by simply reversing apron direction. You control complete operation from tractor seat—including cross-conveyor clean-out before starting beaters and main apron.

Farmhand's new F-40 is 153¼" long, 72" wide and 36" deep. Main apron slats are hi-carbon re-rolled axle steel. Steel sides are specially crimped for extra strength.

**FRONT UNLOADING**—Unload mixed feed, green feed or forage out front. Beaters shred, thoroughly mix and prevent bunching . . . can be used to blend anti-biotics into feed. To unload any pelletized feed or corn out front without shredding, simply remove beaters. Cross-conveyor elevator extension is optional.

## New "200" Power-Box

### . . . another Farmhand work saver!

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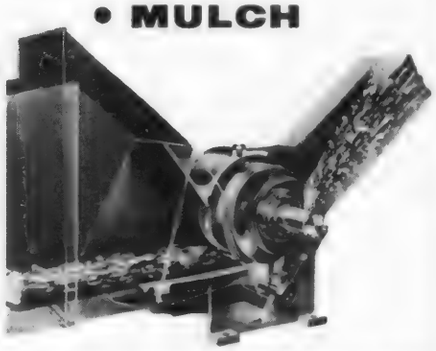

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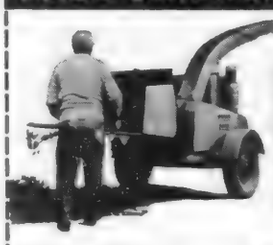

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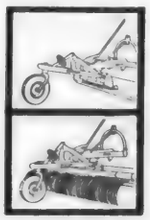

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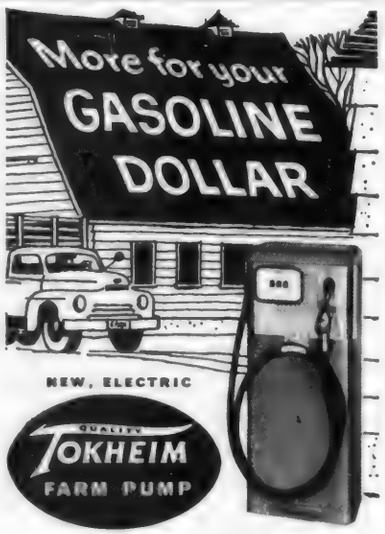


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## WET CORN IN A TRENCH SILO

(*Continued from page* 90)

ground corn stays put when we are getting it out. We use a tractor scoop on the open face of the silo. Now, whole corn would start to run the minute you broke open the face, but this ground material stays in place until you actually dig into it. It forms a wall. The air touches the outside, but it doesn't penetrate. We can carefully take a slice off all the way across in a day or two. In that way the exposed corn doesn't get a chance to spoil. We don't break into the wall of grain until we have to. That way air doesn't get in. This silo is just over 20 feet wide at the bottom and almost 30 feet wide at the top, and 10 feet deep. We've had around 800 head on feed. We'll reach 1,000 soon. I wouldn't want to try it with any bigger silo, or with any fewer cattle, or the spoilage might get ahead of us; but I do believe that a smaller operator might want to use a little smaller silo."

There is about one-eighth more feeding value in ear corn taken from a given acreage than in the shelled corn. Many farmers believe this extra feed value is worth harvesting, but the DeKocks disagree for two reasons: first, because of the extra labor involved; and second, because of field losses.

"Ground ear corn stores real well," said Ralph DeKock, Sr., "but we got more loss in the field with ear corn than with a picker-sheller. But the biggest factor is labor. Handling corn from a picker we use a wagon, and we need one man to handle that wagon. Another man can keep up with the grinder. Our grinder will keep up with two pickers using shelled corn, but it wouldn't keep up with one if we were bringing in ear corn. And we feel it's a little cheaper to put up extra corn silage for roughage than to put up ground ear corn. We've no kick against feeding ground ear corn. We like it. We tried it ourselves and feel it is the labor that licks it."

In their fourth year of operation there are very few changes the DeKocks would make. "We might go to a roller mill," said Ralph, Sr. "I think we'd still get enough fines with a little bigger capacity. And I'd like to have another, smaller silo. This silo is 200 feet long, and last year we put wet corn from 460 acres in it. It's not anywhere near half full, so we're wasting a lot of silo space."

His son, Ralph, the cattleman, explained how they removed and fed the wet corn. "To get the corn out we use a regular front-mounted utility manure scoop. We take the self-unloading auger wagon into the whole corn silo, and count in the number of scoops. Then we pull around in the bulk bin and auger on the supplement, and back into the next silo to load on corn. We measure both silage and the corn by scoops of the unloader; for the supplement, we've got bushel baskets."

### Is There a Catch?

After four successful tries at storing corn in a pit, it can't be a fluke, but the care

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taken by these farmers shows it isn't a process for everybody. On top of the DeKocks' experience, other farmers have followed the lead of the DeKock trio. A big neighbor of the DeKocks stored 80,000 bushels of wet corn in an all-concrete trench last year and found it perfect. They, too, ground in the corn, and sealed it well with black plastic though they used tires for weight, and they removed it with a mechanical corn silage unloader. Even with this tractor-mounted Oswalt unloader, though, the system uses more labor than a tower silo and automatic unloader.

But experts warn: First, it is probably easier to do this in large quantities than with small amounts of corn. Second, the men who have succeeded are topnotch managers, who take care in ensiling it properly. They have learned the skills to make grain silage of corn. Compaction is one secret—and a large pile aids the compaction by its own great weight. A large pile also has relatively less surface for the amount of grain stored, compared to a smaller amount. It may pay to use sodium bisulphite to postpone spoilage in a small pile. Then, as the DeKocks stressed, the silo must be well covered, and the corn *must* be ground.

For anyone anxious to try the method, a FARM QUARTERLY expert suggested:

1. The process will be safer with ear corn.
2. The corn must be ground.
3. The pile should be at least 10 feet across—wide enough to get a tractor wheel on the center of the top to compact the middle as well as the sides.
4. It should be at least seven feet deep.
5. The length is determined by the risk the farmer wants to take; 40 to 50 feet long is probably a minimum. This would hold about 2,600 bushels.
6. The pile must be sealed well, and the plastic covered or weighted.
7. It must be unloaded properly—by a man consciously aware he must not disturb the rest of the pile. The exposed face of grain must be completely removed every 24 hours. If grain lies loose for four days it will spoil. The vertical face of the pile should recede at about one foot every three days. The expert emphasized there are risks to the method, and labor costs will be higher than those for a tower silo.

### Smaller Amounts

Another Indiana farmer, entirely independent of the DeKocks, decided and proved he could store corn the same way he had been storing the whole corn plant—in a horizontal silo. But the case of Cecil M. Bake, of Winchester, Indiana, is different because he started in 1958 with a small trial silo. Bake is different, too, in that his largest silo is only 4,000 bushels.

Bake made a surface silo to hold some 1,000 bushels of ground ear corn the first year. Then in 1959 he added two more silos, of the same type, but each large enough for about 4,000 bushels of corn.


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"The first silo was about 65 feet long and 9½ feet wide," said Bake. "The average depth of ground ear corn was 6 feet. The silo is a surface silo, as we're on level ground here. We made two walls with a bulldozer—actually they're more like large sweet potato ridges, 3½ to 4 feet high at the apex. Then we lined the inside with 4-mil plastic, wide enough to run up the earth walls and overlap outside by about 18 inches.

"The grinding is done by a custom grinder, using a Daffin mobile mill. We run the ear corn through the hammermill and blow it into the silo. We tramp it down by foot usually, though last year we tried to use a tractor. But that's a delicate job as it's easy to damage the plastic. After the silo was full, we covered it with 6-mil black plastic, with enough overlap at the edges to make a double seam. Then we folded back the double seam and covered it with earth to seal it tight. Last, we put tires on top to keep the plastic down tight.

"The two larger silos have concrete bottoms, to make it a little easier to get in and out. They're 125 feet long and 10 feet wide or so. We fill them to the same height."

Bake empties the silos by scoop shovel into a feedcart mounted on the back of a tractor. He feeds just over 100 head of cattle, and finds this is enough to keep ahead of spoilage in the silo while he is feeding out the wet corn. Last year he fed wet corn from the silos until the first week in August, without trouble from the heat.

"I'll have to admit there's a little spoilage underneath the plastic," he added. "But actually I'm sure there's less than the loss you get in a crib from rats and so forth. And even the spoilage goes for feed, mixed in with some good grain."

Bake has 145 acres of continuous corn on a 160-acre farm. Last year he put 110 acres into his three plastic-lined bunks, starting harvest with the grain moisture at 30 percent, and finishing when the moisture had dropped to 24 or 25 percent. He uses no preservatives, and he leaves the end of the silo open while he feeds the corn.

Oddly enough, Bake also has two sons who could pass for twins. The elder, Jim, is the cattleman on the farm; the younger, Ron, plans to teach. The Bakes ran a cost survey of their wet corn storage last fall. Depreciating the cost of bulldozer hire and the concrete for the floors over five years, adding the cost of custom grinding the ear corn and buying new plastic each year, the cost was less than eight cents a bushel.

The experience of the DeKocks and of Bake show it is possible to keep ground corn in several types of horizontal silos, with care in sealing the corn from the air. They both grind the corn, and seal and weight the plastic cap. The corn doesn't spoil along the face of the silo if it is taken out fast enough, and two men are in their fourth year of the process, in silos from 1,000 bushels up to 35,000.

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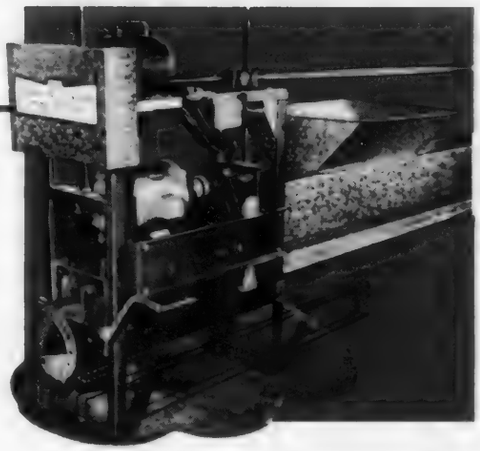

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1) for long periods as a protective coating.

2) Later, when small areas of steel may become exposed, the attack of the elements is directed to the zinc. Though light rusting will finally occur, pitting and perforation are still a long way off. The illustrations at the left give a graphic picture of how zinc coatings work when small areas of steel become bare. You've probably seen examples on your farm. The following chart is a guide to the estimated life of galvanized roofing in the atmosphere. Siding lasts even longer.

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**This is what happens at a small exposed area in a coating of a metal having a greater tendency to go into solution than the base metal. The zinc is slowly consumed while protecting the steel from any attack.**

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*Adapted from "Protective Coatings for Metals," American Chemical Society Monograph Series No. 129, Burns and Bradley.

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(*Continued from page* 93)

by "shuffling" of livestock between markets, a feat accomplished through the collusion of all the market interests, commission men, stockyards personnel, truckers, processors—and the USDA Livestock Market Reporting Service. This is a big, bold charge, one which makes neutral observers and even many NFO sympathizers back off. It simply says that stock were hauled to a market, unloaded, run through the yards, reloaded and hauled to another yards where the same comic opera march was repeated.

In proof of this they offer the testimony of their own checkers who maintained 24-hour-a-day vigils at terminal markets, country buying stations and packing plants. Also, during the holding action, farmers were urged to appear at the markets en masse to judge the results for themselves. At Kansas City 2,000 are said to have shown up one day, 3,000 at East St. Louis and about 1,500 at Sioux City. This was not a picketing action. It was merely an effort to see what was going on. At no time during the holding action was there any violence. This is one fact that is undisputed by both sides. On all other points there is the widest divergence of opinion.

The extreme prices demanded during the holding action would seem to indicate an absolutely unrealistic approach on the part of the NFO. Staley maintains, however, that these demands are unquestionably sound. The prices are not set arbitrarily, he points out. They are set by county meat bargaining committees throughout all the areas where NFO is organized. These committees are furnished detailed figures based upon Iowa State University data on the cost of production of the various types of livestock. From these figures they make their recommendations to the central office as to the prices to be asked. The prices include costs plus a profit.

"Besides," says Staley, "years back, when costs were much lower than they are now, cattle sold from $35 to $40 and hogs were bringing $25 to $30. Farmers weren't having too easy a time then. Costs have climbed continuously since those days. Is it unrealistic, then, to ask for $32 cattle and $22 hogs today?"

Another barrel to the holding action gun is the "no buy, no sell" campaign, a step agreed upon in the summer of 1960 at a special Des Moines meeting attended by 10,000 farmers. If one or two processors should indicate an intention to bargain with the NFO, the members would be encouraged to sell only to those processors. They would refuse to sell to others. The "no buy" section is directed primarily against feed processors who are encouraging vertical integration.

The two points of criticism most frequently brought against NFO are its membership agreement and its alleged tie-in with organized labor. Let's take the latter first.

There have been numerous incidents to point up cordial relations between NFO and organized labor: unofficial appeals to labor organizers, for example, for advice and help in the early days of the association; the appearance of labor leaders as speakers at the annual conventions of the group; and the use of a labor-sponsored commentator to present NFO's case on TV. None of this, of course, is prima facie evidence of a coalition.

But there was one incident in the past which Staley admits has caused embarrassment. This was a gift of three $1,000 checks from the United Auto Workers to the NFO. It was presumably used to print an issue of "The NFO Reporter" for the young organization. But the repercussions were unpleasant. The then treasurer of the NFO resigned because of what he called mishandling of the funds, and the incident has been used ever since to cite the relationship between NFO and organized labor.

"We appreciate the help but we'd have been better off if we'd never seen that money," Staley says. "This is the only money we have received from an outside source and it was before we became a collective bargaining organization."

### The Agreement

When a man joins the National Farmers Organization it is not merely a matter of signing a simple application card which obligates him to little or nothing in the way of future responsibilities. The NFO membership agreement is a lengthy document


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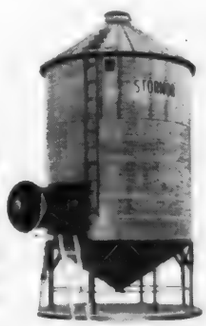

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of 12 Articles, most of which are divided into a number of sections. There is nothing in it *per se* which might be damaging to a signer. But the individual who signs it should realize that it is a legal document, drawn up by legal talent, and there is good reason why he should discuss it with his attorney before putting his name to it. It contains clauses which definitely affect his future rights and income. Some of the more important of these are the following:

AUTHORIZATION—I authorize the National Farmers Organization, its agents or representatives to act for me as my exclusive representative in collective bargaining in respect to all commodities marketed from my farm, with the exception of those commodities presently covered by other marketing contracts, and to enter into contracts with the processors of products I own and control covering the selling prices and other conditions of disposal, and establish marketing procedure. I further authorize the said organization to act as my exclusive representative in the presentation, prosecution and adjustment of any complaint that I may have against the processor of the commodities of my farm, in accordance with and subject to the rights and privileges granted me by the By-laws of the N.F.O.

This authorization and direction shall be irrevocable for a period of three (3) years from the date appearing above. I agree and direct that this authorization and direction shall be automatically renewed and shall be irrevocable for successive periods of three (3) years each unless written notice is given by me to the N.F.O. not more than twenty (20) days and not less than ten (10) days prior to the expiration of each three (3) year period. This authorization is made persuant to the provisions of the Capper-Volstead Act enacted February 18, 1922.

Note that this article makes the NFO the farmer's bargaining agent. It binds him for three years and then for succeeding periods of three years each "unless written notice is given by me to the N.F.O. not more than twenty (20) days and not less than ten (10) days prior to the expiration of each three (3) year period." The member must take positive action to withdraw within a very definite period of time. There is no such thing as a membership lapsing.

RATIFICATION OF MARKETING CONTRACTS—No contract consummated with a processor shall be effective or binding until it has been ratified by a two-thirds' vote of members in a marketing area who have signed con-


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tracts with the N.F.O. for the commodity, attending a meeting called for that purpose by the Marketing Area Bargaining Committee and has been approved by the Board of Directors of the N.F. O. . . .

MARKETING REQUIREMENTS—Sec. 1—Until such time as a contract has been consummated with the processor for a commodity I own or control in accordance with the provisions of this agreement, or until a marketing procedure has been established for a commodity and ratified in accordance with the terms of this agreement, a member shall be free to market his commodity as he chooses.

Sec. 2—When a contract has been consummated in accordance with the terms of this agreement covering a member's commodity, and he sells this commodity to a processor other than the one specified by the agreement, the member shall be assessed 10% of the gross sale of the commodity for liquidated damages.

These sections leave the member free to market his commodities and livestock as he sees fit until such time as a contract is consummated with a processor and ratified by two-thirds of the members in the marketing area. After such a contract has been signed and ratified he is subject to an assessment of 10 percent of his gross sales of the commodity affected by the contract if he sells to anyone other than the contracting processor.

MEMBERSHIP DUES AND FEES—Sec. 3—When a marketing contract has been consummated by the N.F.O. covering a member's commodity, it shall provide that the processor check off 1% of the gross sales of the commodity for the N.F.O. This amount shall then become the member's dues and shall replace the dues and fees otherwise prescribed above in Sections 1 and 2.

This is the checkoff clause. After a contract has been consummated the NFO becomes entitled to one percent of the gross sales of the commodity concerned. If, for example, a contract is signed covering a producer's hogs and his hog sales gross $10,000 during the year, the processor will deduct $100 and remit to the NFO.

There is nothing inherently unjust, illegal, or immoral in these or any of the other provisions of the membership agreement though the opposition are inclined to make quite a to-do about some of these items. The point is, no one should sign the membership agreement without having studied it carefully.

There is nothing in the agreement, incidentally, to compel a member to participate in a holding action.

Bob Casper, Winterset, Iowa, farmer and vice president of NFO, a bit older and less a spellbinder than its president, but an extremely effective spokesman, sums up agriculture's predicament this way: "The farmer is in his present fix because of his lack of ability to price his products. This can be remedied by legislation, or by our own action. The latter, we think, is preferable.

"Farmers must be independent of any political party. It is ridiculous for them to be forced to support government policies of which they disapprove in other fields, because the party supporting those policies also happens to have the best program for farmers."

But can the NFO, in the long run, enable the farmer to price his products unless it also does something about controlling production?" "No," says Casper, "but we intend to work on that angle, too. Once we have our processor contracts we will know what the demand is for the various products and we can advise our members to adjust production accordingly. We also hope to set up our

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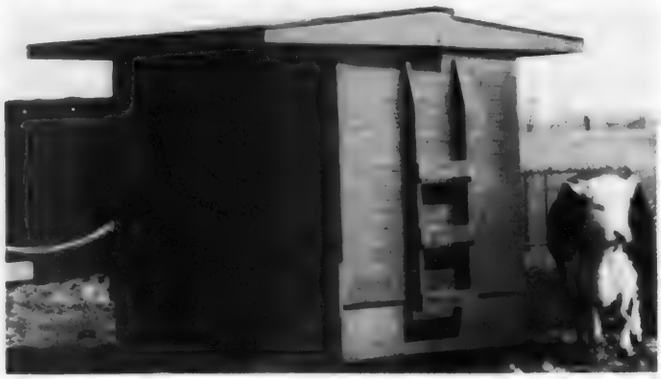

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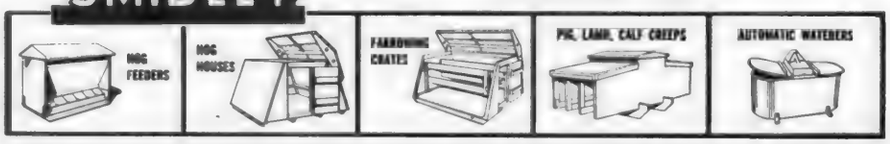


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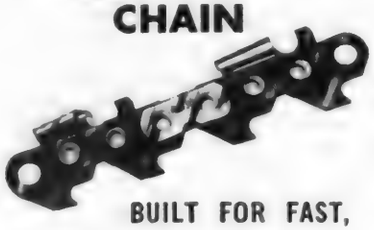

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The NFO agreement contains a clause authorizing, if necessary, the establishment of production quotas for members on a specific "quality, bushel and poundage basis" and "administered by the establishment of pools based on quality." Another section authorizes checking off funds "at the processor level" to set up a surplus disposal program.

There will be further holding actions involving more territory, more producers and more livestock and commodities, though these actions have alienated some of the NFO's earlier sympathizers. Ex-Governor Turner, for example, is no longer connected with the organization. "But I'm not condemning it," he says. "I think that as a protest group it may do some good. I'm not convinced that the attempt to hold livestock off the market is the way to do the job."

Staley himself, in appraising the apparently limitless enthusiasm of his following, has an apt description of NFO. "It isn't an organization," he says, "it's a disease." Friend and foe agree.

## GOLD FEVER

(*Continued from page* 56)

forward, with the high knee used as a fulcrum for the left elbow in turning the pan. It was difficult for George, who hadn't done deep knee bends since he changed to a milking parlor. Little-used muscles come into play, and it requires practice to uncramp them after squatting for an hour or two. However, Ripper explained, once learned, this position becomes more comfortable than any other. Old prospectors making a social call often pass up a soft couch to squat on the floor.

Now that George and Amelia knew the simple rudiments of gold panning, they were eager to be on their own. They decided to tackle Sam Moon's trench. George sat down, up to his neck in river water, and with a bent soup can spooned out the sand from the niches and crannies of the trench. Amelia squatted in the shallows near the bank and panned out his findings.

George and Amelia Pruett were only the last of many generations of gold seekers who had been intrigued by Sam Moon's trench. Ripper sat on the bank and entertained the workers with his version of Sam's history.

According to Ripper, Sam was a grocery clerk in Sandusky, Ohio, who caught the gold fever by reading about the '49 strike in California. He hastened to Independence, Missouri, but missed the last wagon train that fall for California. As second choice he joined a northern train and reached Oregon. He then began to work his way down the Willamette Valley, prospecting as he went, on his way to California. When he reached the big bend in the Rogue River, he found a gravel bar and put two ounces of gold in his poke in as many days. This was good enough for Sam. He built a cabin on a ford near Gold Hill.

Near his cabin he laboriously chipped out a trench in the bedrock which formed a ledge in the river. During low water the

ledge was only a few inches below water. The winter floods dropped gold-bearing sands into the trench, and each spring Sam panned it out. It was like an annuity to him. When he got old and infirm it supplied him with all his simple needs.

For more than a hundred years Sam's trench has been emptied each year by the person who got to it first after the spring floods. One greedy man drowned because he arrived too early.

The Pruetts were early too, for the Rogue was still carrying the last of the melted snow from Mt. McLaughlin. George was stiff with cold, weary and waterlogged, but in the spirit of the Klondike he carried on. He was warmed by a cry from Amelia, who was finishing her first pan of sand. She pointed out to him, nestling among the grains of black silt in the bottom of the pan, a tiny speck about the size of a gnat's wing. It wasn't much, but it was pure, virgin gold. Amelia retrieved it on the tip of her finger and deposited it in an aspirin bottle.

Ripper told her she had lost most of her "color" because she was a beginner, but predicted she'd become an expert. "She has the touch," he said with authority. "Can't figure out why you folks didn't try this back East. There's gold there, too, I guess."

One Saturday morning, while the Pruetts were working on Sam's trench, a couple beached their rowboat. They took out a shovel and gold pans, and went to work on a sandbar. The newcomers were schoolteachers in Gold Hill, and spent their weekends panning gold. This, the Pruetts learned, was typical of the region. There is one or more gold pan in every home. Traders buy and sell, teachers teach, surgeons operate, housewives do the family wash, but they all break for the diggings. when they have the first spare moment.

When George and Amelia had exhausted Sam's trench they looked around for other fields to conquer. They had what Ripper estimated to be about $20.00 worth of dust—at $35 an ounce—in the aspirin bottle. This figured out about twenty cents an hour for their combined labor. But money is not everything, and gold is another matter. They talked and dreamed of the big strike.

They had been doing the simplest form of placer mining, washing out sand and gravel by the shovelful, in a gold pan. A more elaborate form involves the use of a sluicebox or a rocker. A sluicebox is a wooden trough into which a current of water is diverted. On the floor of the trough slats, wire mesh, or carpet is placed to catch the gold. Gravel is shoveled into one end of the trough and as the stream washes the larger particles away, the gold settles behind the slats or into the mesh of the screen or carpet.

A rocker is a cradle-like contrivance into which gravel is shoveled. A long-handled dipper is usually used to dip water over the gravel, washing the gold-bearing sand through graduated grills or screens, where it is caught in a gold pan and washed out.

Scuba diving has invaded the gold mining field in a big way during the last two or three years. The skindiver moves along the bottom of a stream looking for gravel pockets behind ledges and boulders. Once he has located a likely-looking pocket he uses a hydraulic dredge to bring out the gravel. These dredges are ingenious devices. A gasoline engine on the bank, or floating on an inflated tractor inner-tube, provides the pressure for a stream of water which forces the gravel over a small portable sluice attached near the nozzle of the pressure hose. When the operator believes he has caught enough paydirt in the sluicebox he surfaces and pans out the contents of the box.

Dredges now on the market range in price from $450.00 for a three-inch size to $1200 for a twelve-inch size. The three-inch size will run eight tons of gravel through the sluicebox in an hour, leaving about a bucketful of sand to pan out.

The beds of the streams have rarely been touched, whereas the banks and the sandbars have been worked innumerable times during the last century. Large boulders and ledges in the streambed are perfect catch basins for gold-bearing sand. But Ripper scorned the skindivers. "It ain't the way God intended gold to be mined," he said. The Pruetts doubted that God intended gold to be mined in any particular way but they felt this modern touch destroyed all the romance of the game.

The Pruetts learned of two other methods of extracting gold from Mother Earth—hard rock mining, and pocket mining. Hard rock mining involves expensive crushing machinery and con-


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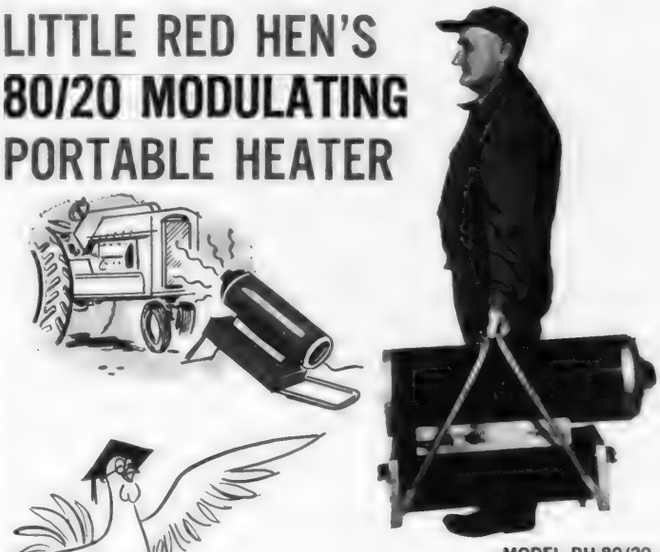

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siderable labor in tunnels, and sometimes blasting. This commercial approach did not interest the Pruetts. They did explore the possibilities of pocket prospecting, which Ripper said was the true professional method. "You start at the foot of a canyon or creek and work up, panning here and panning there, until you strike color," he said. "Now, gold doesn't travel far except when it gets into running water, and it always travels straight down. So you dig a hole a little ways up the slope and pan again. You keep digging and panning, and as long as you get some color you know you're on the right track. When the color runs out, that means the pocket has gone underground. Then you start diggin' right through the mountain until you find the pocket."

Ripper said that he personally had made thousands of holes in the Oregon mountains. "I found some little pockets and then at other times the color just disappeared. Once I took out $6,000 from a pocket no bigger than a wagon box."

Among Ripper's favorite tales of gold strikes was the saga of the Rotan brothers. Joe and Een Rotan made their big strike on Sardine Creek, where a pocket returned them more than $400,000 in nuggets and dust. When they had worked the pocket for a week or two they went into Rogue River one Saturday night and bought the Homestead saloon, lock, stock and full barrels. They threw the biggest and most exuberant celebration ever known in Oregon mining annals. In the morning they gave the saloon back to its original owner, lock, stock, and empty barrels.

Later they took $100,000 in gold to San Francisco in two saddlebags and bought another saloon. Their habit of buying drinks by the saloon rather than by the bottle was their undoing. "They died broke," said Ripper, a little sadly, but with complete understanding. "What does a miner care about money?"

Man's affinity for gold leads him into a strange gullibility. The Pruetts believed every word of Ripper's story. When they retold the tale they embellished it a little, as Ripper had. In reality, the Rotan brothers took less than $100,000 from their famous pocket.

When the Pruetts went shopping for a claim, they had reached the chronic stage of the gold fever. Ripper never ceased efforts to

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convert them to pocket prospecting, but neither of them felt up to the arduous treks into the mountains, leading a burro and living on back fat and beans. When they persisted in taking out a claim, Ripper recommended Sardine Creek. At one time, he said, there were 135 claims along a few miles of this small stream.

George and Amelia found there was no lack of claims for sale. Ripper introduced them to a colleague, Walt McClain, who not only worked his claim on Sardine Creek, but had numerous options on others. McClain, Ripper assured them, would give them wise counsel and guidance.

McClain said that during the big depression Sardine Creek swarmed with people who had no source of income other than what they could pan out of the tired gravel.

"Sardine Creek has had so many goings-over that it is a wonder there is anything left," he continued. "First there were the prospectors who came here soon after the California strike. Then when the railroad was finished just after the Civil War, the Chinese laborers came here and gave it a second working-over. Then when this area was opened to homesteaders, they gave it a third going-over during their spare time. But these hills are full of gold, and a little comes down after the rains every year."

McClain said there was a claim about a half mile up the Sardine which was "real good, real promising. The owner was doing real well when he came down with arthritis about a year ago. Needs the money. You can get it for $500, a real steal."

In about a week the Pruetts had the papers on their own claim. They hauled up lumber, bought a set of tools and a wheelbarrow, and under Ripper's supervision built a sluicebox. They began gouging out the bank and wheeling the gravel to the head of the sluice.

But the Pruetts scoffed at the idea that they had gold fever. "Just a passing interest," they said, until an incident on the first day of the trout season. George, an ardent fisherman, took off with rod and creel. When he came in late that afternoon, he found Amelia squatting on the kitchen floor peeling potatoes. He squatted beside her and began to dress the trout he had caught.

"Look at my hands," Amelia said. She showed him a hand full

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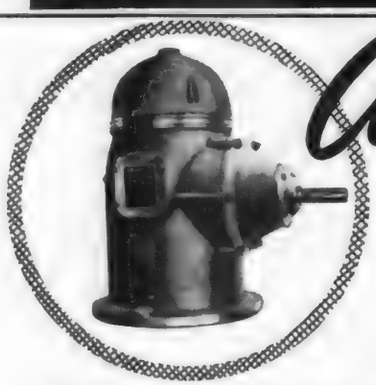

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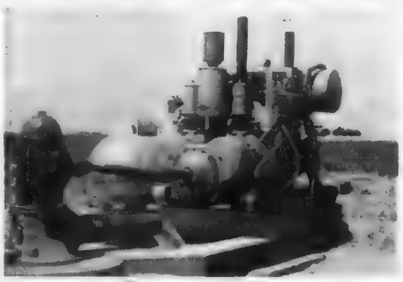

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of calluses.

"I've about run out of knuckles myself," George replied. "Maybe I should have kept on taking life easy. Maybe we should have bought another farm. Maybe we should not have retired."

"Don't be silly," Amelia snorted. "Never felt better in my whole life. And do you know what? I found a likely-looking slope just beyond the big pine."

"Is there enough light left to try a pan this evening?"

George and Amelia Pruett left their trout and potatoes and gathered up their shovels and pans.

Diagnosis, gold fever; prognosis, chronic.

## MORE CORN TO STORE

(*Continued from page* 60)

Gathering, snapping, and shelling, then, are the harvesting processes during which losses can be reduced by properly adjusting the machine.

### The Gathering Units

The gathering units or dividers on a corn harvesting machine are equipped with hinged points to enable them to follow the contour of the ground. For minimum loss of ears, gathering points should be operated at ground level, or as low as the surface irregularities of the land permit. Properly set, the gathering units will lift lodged and leaning stalks and direct them into the machine along with the standing stalks.

The chains on the gathering unit should be timed so the fingers on opposite chains are evenly staggered. Improper timing will result in the delivery of a group of stalks to the snapping rolls, rather than passing one stalk into the machine at a time. Group delivery reduces snapping efficiency and leads to clogging.

When picking corn which is down or leaning badly, it may help to lower the gathering unit so the gathering chains run closer to the ground. On some pickers, speed of the gathering chains may be changed without affecting other parts of the picker. Increasing gathering-chain speed may help in picking lodged stalks off the ground. The instruction manual for your machine shows whether this adjustment can be made.

### The Snapping Units

The snapping unit works by pulling stalks downward between the snapping rolls. The ears, which are too large to pass through with the stalks, are snapped off.

Three important adjustments can be made on the snapping rolls: (1) clearance between the rolls and (on some new machines) between the stripper plates; (2) aggressiveness as affected by roughness of roll surfaces; and (3) roll speed.

Clearance between the snapping rolls is critical. Usually only the lower end of the rolls can be changed. On most of the late model tractor-mounted pickers and corn combines the operator can vary the roll spacing to accommodate the stand without stopping.

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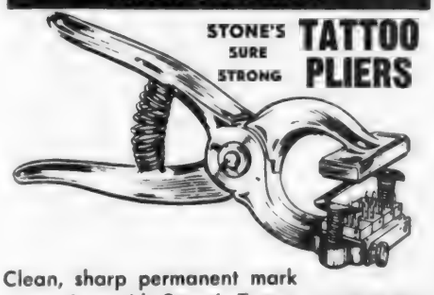

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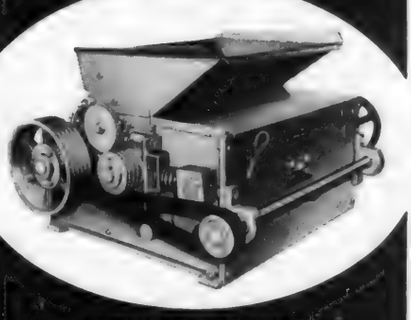

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The snapping rolls should be operated as close together as the condition of the crop permits. Proper spacing is just wide enough for rapid clearance of stalks and trash—usually a separation from ¼ to ½ inch, measured from the peaks of the spiral ridges.

Close roll adjustment helps when stalks are damp and ears are hard to snap. Wider than normal adjustment is advisable when a large percentage of the stalks is down, or standing stalks are dry, brittle, or frozen.

Improper spacing promotes losses. Rolls that are too far apart run up on the ear instead of just contacting the butt and shell off kernels. Small ears and nubbins may pass between the rolls and drop back on the field. Too close an adjustment encourages stalk breakage and clogging.

Aggressiveness affects shelled corn losses at both extremes. Overly aggressive snapping rolls shell kernels when the ears are snapped. Rolls which are not aggressive enough fail to hold stalks sufficiently. When stalks are dry, they slip while ears are being snapped. The ear is held in contact with the rolls too long and gets partially shelled. Insufficiently aggressive rolls also cause an accumulation of trash which interferes with snapping.

Aggressiveness may be modified by adding or removing snapping roll lugs available from some manufacturers. An arc welder can be used to run small beads on worn rolls to help increase their grip. But badly worn rolls should be replaced.

Snapping rolls should turn at the proper speed. If they turn too slowly, stalks are pulled out by the roots. If too fast, they tend to drive stalks into the ground and break them. In either case losses are increased and clogging becomes a problem. You may be able to vary snapping roll speed on your machine without affecting other parts. If not, regulate the rate of forward travel so that stalks are not broken or pulled up.

### Stripper Plates

Many late model combines have a snapping unit equipped with stripper plates above the snapping rolls. The snapping rolls of these machines are designed to be highly aggressive because ears are not supposed to come into contact with the rolls. This reduces shelling losses in the snapping unit if the operator carefully matches the stripper plate clearance to the size of stalks entering the machine. Because of the greater aggressiveness of the snapping rolls, ears that do pass between the plates and contact the rolls are usually lost.

### The Husking Unit

Adjustment of the husking unit is important even though kernels shelled off the cob in the husker are not lost. USDA tests show that for storage with minimum spoilage, the maximum amount of shelled corn which should be tolerated in a crib of ear corn is one percent. A husker out of adjustment also results in more husks and trash in the crib. This wastes space and reduces

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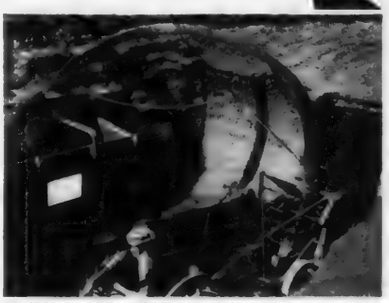

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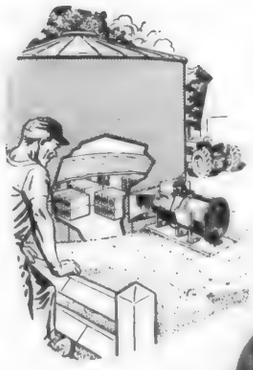

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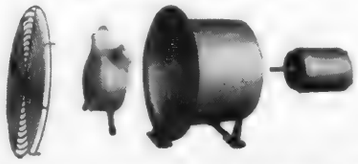

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natural airflow through the crib. The following aspects of the husking unit are adjustable: 1) Aggressiveness. Husking roll tension must be varied with crop conditions. Insufficient roll pressure causes ears to be retained by the rolls, resulting in shelling and clogging. Husks slip between the rolls instead of being pulled off, and keep the ears against the rolls. Excessive aggressiveness can increase shelling loss. Aggressiveness of the husking rolls is adjusted by adding or removing husking pegs, pins or screws. Rubber coverings on rolls should be replaced if worn. 2) Feed apron or ear retarder. Ears coming into the husking unit should be distributed evenly over the rolls. The objective is to keep the ear on the husking rolls only as long as is essential to remove the husk. Adjust husking bed feed apron and ear retarder accordingly. 3) Husking roll speed. Excessive speed promotes shelling. Low speed tends to clog the husking unit. Check the husking roll speed on your machine. If speed and tension are proper and you experience overloads on the husking bed, it may be from driving too fast. Or poor snapping roll adjustment is resulting in excessive trash being fed to the husking unit.

### Shelling, Separating, and Cleaning

Field shelling is most efficient when kernel moisture is on the low side. To do the job, two types of shelling arrangements are used on picker-shellers, or on pickers to which a sheller has been attached. The first type consists of a beater-type cylinder operating over a concave composed of bars or perforated sheet metal. The beater rubs the ears repeatedly over the concave. The shelled kernels fall through while cobs move axially along the shelling unit. Projections on the surface of the cylinder are so arranged that the turning cylinder forms a spiral to move cobs along. An adjustable gate at the discharge end of the cylinder allows the operator to vary the length of time that ears remain in the shelling unit. With higher kernel moisture, shelling takes longer.

The second type of shelling unit has a rasp-bar cylinder similar to the one used in combines. The rasp-bar cylinder also operates over a concave, but at a much higher peripheral speed than the first type. The lack of a retarder for keeping cobs from moving past the cylinder too soon must be compensated by a more precise adjustment of the cylinder speed and the clearance between the concave surface and the cylinder. By referring to the instruction manual and doing some experimenting with cylinder speed, a compromise between cracked kernels (too fast) and kernels left on the cob (too slow) can be achieved. Cobs should pass practically unbroken, as a cylinder does not have a good chance to remove kernels from a broken cob. The concave clearance should taper from 1¼ inch at the front where the ears enter, down to ⅝ or ¾ inch at the rear.

The separation and cleaning equipment should operate at the speed shown on the decal on the machine itself or given in the

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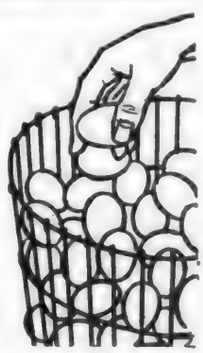

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operator's manual. Keep rack openings from becoming plugged with small pieces of cob. On the cleaning unit, be sure to set the sieves and to adjust the quantity and direction of the airflow as given in the operator's manual.

### Corn Combines

The gathering and snapping unit of a corn combine is basically the same as that of a picker, and therefore the adjustments are similar. There is one type of combine, however, that cuts the stalks and feeds the entire plant through the machine. This method eliminates snapping roll losses. Although the shelling and separation processes are the same as with other combines, it is more important to watch for separation losses. There is more material in the machine to carry grain out along with it. So it pays to match ground speed to the machine's capacity. Minimum cob breakage and proper sieve and wind adjustment, as well as periodic cleaning of sieves and straw rack, is also very desirable.

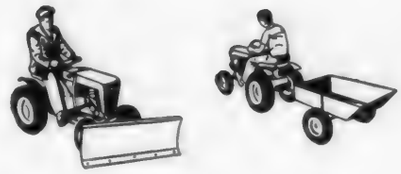
Although repairs can be made early in the year, machine adjustments must be repeated many times during harvest. An occasional glance behind the moving machine is a poor way to determine losses. A true picture requires careful checking at several points in the field. Don't kid yourself by selecting locations which appear to have either excessively high or low losses. If you can't make up your mind where to check, toss your hat down the row. Check ear corn losses and count kernels shelled, on the ground near where the hat lands.

Ear corn losses are revealed by observing how many ears of corn were dropped in 90 feet of row. One ear per 90 feet of row equals 140 ears per acre, and it takes 140 half-pound ears to make one bushel weighing 70 pounds. Since most ears weigh more, this is a conservative estimate.

A bushel of shelled corn is equivalent to an average of two kernels per square foot on the field. For a good representative check, measure off six feet of row and observe the number of kernels out to a distance of 20 inches on either side. This area represents 20 square feet for rows spaced 40 inches apart. Two hundred kernels in this area represent a loss of five bushels per acre (dividing by 20 for loss per square foot, and by two to convert to bushels per acre.)

Before conducting a loss check, remove any loose ears from the check area so you won't confuse preharvesting losses with those caused by the machine. Next, operate the machine through the test area at the desired speed.

Ears still fastened to the stalk indicate the gathering units are too high. Loose ears lying on the ground with the husks undisturbed were probably snapped from the stalk before they entered the machine. Partially husked ears contacted the snapping rolls but slid off the lower end. Those whole ear losses are caused by driving too slowly or too fast, or without centering the snapping units on the rows. A machine driven at high speed, and poorly centered,



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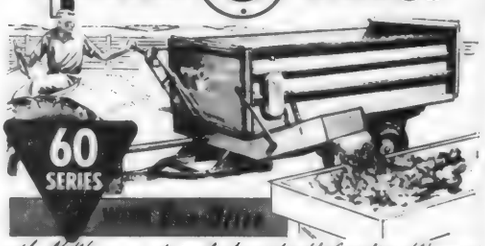


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whips the stalks vigorously and increases the ear losses. Under ordinary field conditions speeds should be kept to 3 to 3½ miles per hour. Shelled corn on the ground, along with an occasional broken, or partially shelled ear, may mean snapping rolls are spaced improperly, turning at the wrong speed or operating too aggressively. It could also indicate the picker is traveling too fast.

In the case of field shelling, losses in gathering and snapping should not be confused with shelling losses. Most of the snapping loss will be in an area 8 to 10 inches on either side of the row. An improperly adjusted sheller, on the other hand, deposits its losses wherever the cobs fall, possibly midway between the rows covered by the machine. Kernels remaining on pieces of cob discharged from the sheller represent a shelling loss. Loose kernels are a separation, or cleaning loss.

These loss indicators hold true for a corn combine as well as for a picker-sheller. To make sure of the type of loss, you may have to catch a sample of material discharged from the machine while it is operating at normal speed.

After you have reduced your harvesting losses you may want to check on the value of the product saved. Harvesting losses can be expressed directly in cents per bushel, or total cost for a given acreage for the cash grain farmer. For a livestock feeder, losses can be expressed in terms of additional animals that could have been fed.

### Looking Ahead

After the corn is cribbed, you can plan on harvesting even more corn next year by asking yourself questions about this year's crop. Were there a lot of weeds or insects in the field? Intensive weed control next year may pay off in easier harvesting, in addition to higher yields. The same goes for insect control. Corn borers are one of the prime sources of lodging, and missed ears. Does the corn variety you use now show signs of susceptibility to lodging? What about maturity date, height of the ears on the stalk, the size and shape of the ears, the shank and husking characteristics, and the susceptibility to undesired shelling?

The hybrid you grow can be matched to the machine used for harvest. If you use a cornpicker without sheller look for a hybrid with fairly loose husks to take advantage of cleaner husking. If you want a hybrid adapted to field shelling, look for an ear with a solid cob, a strong shank and a firm husk. These characteristics mean fewer dropped ears and less shelling by the snapping rolls.

Choosing the proper varieties, keeping ahead of the weeds, and having a properly adjusted machine ready when the moisture content of the corn is right for harvesting, will add to greater profits from the corn crop with little additional investment.

THE AUTHOR: K. A. Harkness, an assistant professor in agricultural engineering at The Ohio State University, is also engaged in research concerning the harvesting and treatment of corn, small grains, and soybeans.

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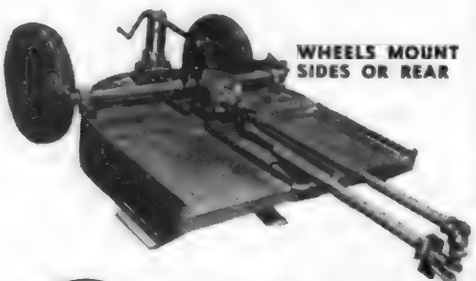


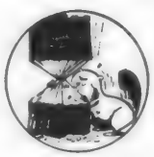


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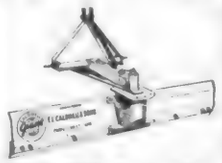
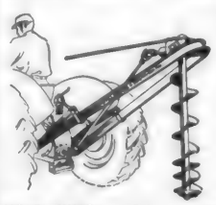


GRADE KING—For leveling, spreading dirt, sand, gravel, smoothing roads. 6-ft. blade on 13-in moldboard. $99.50



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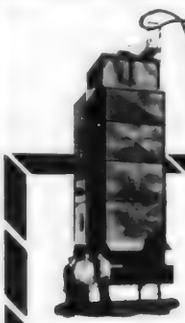

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# THE LAST WORD

**Sandy Concentrate** Two percent white sand added to a high concentrate diet increased cattle gains by half a pound a day in Iowa feed trials. The University is not ready to make recommendations as yet, but they're keenly interested. The best guess is the fine sand has the same scrubbing effect on the rumen wall that roughages have. This scrubbing may remove a thin layer of dark material found to form when animals are on a concentrate ration.

**Days Beyond Recall** More in sorrow than in anger, Dean William Tate, of the University of Georgia, recently lamented the passing of the wonderful agrarian life he knew as a child and its replacement with today and tomorrow. He said, "I was born on a large north Georgia farm, where the Salacoa Creek breaks from the foothills and waters a large and fertile mountain valley. As a little boy, I loved to be with the Negroes and the mules and the plows, and I got a great egotistical satisfaction in going down after school and holding the handles of the big turning plow, as it was pulled through the rich soil by two pair of mules. I thought that I was 'something,' like the captain of a ship or the leader of a great army. I can still remember the click-clicking-clicking of the corn planter as it dropped single seeds in the furrow, and I have walked through those fields and looked down the long rows where the new sprouts of corn were bursting from the dark earth. As an older boy I have followed a mule, affectionately called by us 'jarhead,' to 'bust' the middle of those furrows or to 'dirt up' the corn or to plow down the weeds with a scooter point. My arms still ache from hoeing, as I chopped down cockleburs, morning glories, wild pea vines, Bermuda or Johnson grass, and I have watched those fields turn from the green of the spring to the brown of foddering time. I still remember the sound that the first ear of corn makes in an empty wagon bed, and I remember the quieter sound of the ear when it falls into the wagon nearly filled. And I have helped throw those ears into the crib, and I have shelled the corn from the cobs. The old sheller still stands at home with its heavy wheel and handle, a diabolical instrument which any farmer today would spurn in the time of electric motors and gas machines. But I have turned that corn sheller until my arms and shoulders were tired, until the 'monkeys' got on me, as we used to say, and I would spell myself a while, go to the well for a dipper of water. . . . And I have carried that corn to Mosteller's mill to be ground. . . . I went in the mill where Mr. Fowler was, the old miller, with his overalls and hat whitened by the drifting dust of the meal, which had also outlined in the dark caverns of the roof the cobwebs as if they had been snowed upon. I have seen him test the texture of the meal with the skill that Chaucer spoke of when he said 'The miller with the golden thumb,' and I have watched him adjust the grinding rocks for finer or coarser meal. . . . Then at home my mother and the cook made from that meal corn muffins for breakfast or corn pones or corn sticks for dinner and supper—good nut-like, crisp, brown corn bread. . . .

"But what do my two boys know about bread, two boys raised on the paved streets of a growing city, two boys who collect postage stamps, play the trombone, and go every Sunday to the Methodist Youth Fellowship? My boys will never know what the Bible means when it says 'by the sweat of your brows ye shall earn your bread.' . . . Bread to them means something that their mother buys every Saturday, wrapped in cellophane, that despicable Yankee contraption designed to keep honest Southerners from their food. That bread is already sliced as a comment on their mother's industry, and she gets free damn green stamps with every loaf. My boys will forever be poorer, and other American boys, because they will never know what I learned as a country boy on a Georgia farm."

**Contagion** Gold fever (see page 56) has claimed another victim. R. J. McGinnis, FARM QUARTERLY's editor emeritus, who wrote about the dread disease, is now himself a victim. From the west coast he proudly sent us a box containing a small pill bottle in which was a pinch of blackish material. With it came these instructions: (1) Fill bottle level full of water. (2) Tighten cap. (3) Grasp bottle firmly between thumb and forefinger. (4) Stand with light coming from behind you. (5) Hold bottle above eyes and look at contents from bottom. (6) Note the black sand and the "color." (7) Say, "Ah-h-h-h-h GOLD!" We followed his directions and sure enough, there, surrounded by black sand, were the glittering grains of gold he had dug. It's sad to see a man you know succumb this way. Reminded us that they used to pan for gold in the creek running through our farm. They say a fellow who once owned the place used to make a fair living at it. Just curiosity, of course, but we can't help wondering how a well-burned skillet would work as a gold pan.

**Hopedale Revisited** Three years ago when we wrote of the hospital farmers built (Country Hospital, Summer 1958) we mentioned the hopes which Dr. Lawrence Rossi, the director, had for it. "Wouldn't it be wonderful if we could build a row of efficiency apartments next to the hospital for older folks who are reluctant to live alone on the farm or to be a burden to their children?"

On June 11, 1961, Dr. Rossi and the farmers who built and own the Hopedale hospital dedicated the first unit of the housing project which was a dream but three years ago. Forty-four people can live in the one- and two-room apartments built next to the hospital. Each apartment has its own outside door and they are arranged to insure complete privacy—yet each is also equipped with an emergency intercom to the hospital. The two-room apartments have a kitchen, though a central dining room is available to all residents. All apartments are air-conditioned and all are equipped with tiled bath and shower and wall-to-wall carpeting. Seven years ago this town was about to lose the services of the only doctor who would make the trek from Peoria for regular house calls. Now it has seven doctors on the active staff of the hospital, and a consulting medical staff of 27 specialists who will come when needed. Hopedale, Illinois, has become a small medical center and a model for other communities—all because a group of farmers and their doctor decided to do something about their problem.

# grand opening

It's a snap to move farm machinery in and out of this steel building. Both ends of the structure have king-size doorways. The inside of the building is king-size, too. Plenty of room with no wasted space, because the deep-corrugated steel shell needs no ties, braces or columns. It's strong and tight as a steel drum.

A steel-built farm building can be erected quickly. This one was delivered in panels of heavy gage galvanized steel sheets that were easily bolted together at the site. Steel buildings are also versatile. Half of this 30 x 100 foot building is used for grain storage and the other half for machinery.

Next time you need a new farm building—make it *steel*. For more information about the many types and sizes, send the coupon.

Steel For strength, versatility, beauty, economy.

*Verle Keim farm, Edgar, Nebraska.*

USS TRADEMARK **United States Steel**

United States Steel Corporation
Room 6300, 525 William Penn Place
Pittsburgh 30, Pennsylvania

Please have manufacturers send me information on steel farm buildings for the following: Poultry____ Dairy____ Beef____ Hogs____

Machinery____ Storage____ Other____

Name____

Address____

City____ Zone____ State____

*Another request coupon on page 100*

U. S. Steel does not make factory-built steel buildings, but supplies galvanized steel sheets, structural members and bars to steel building manufacturers. Your request for information will be forwarded to them.

Today's farmer has new muscles as the result of scientifically engineered machines—such as New Holland's new Crop-Cruiser shown above.

# The amazing new muscles that science has given farmers

The farmer now has the strength of a Hercules at his command. The strength of his back and a team of horses are no longer the limit of his power.

Science has given every farmer the strength of many men: a revolution in power with efficient machines, ingenious machines, durable machines that free him from slow, exhausting, arm-aching labor.

Science has made this possible—the same science and engineering that are employed in designing every New Holland machine.

The latest example is New Holland's Crop-Cruiser, shown above. With it, a man can chop and load forage faster than he ever could before. And far more easily, too: he aims the harvester by looking ahead, not behind—and all controls are at his finger tips. There's no need to hand-cut the first rows, or to run them down with the tractor. No tractor is needed—the Crop-Cruiser is self-propelled.

When big new steps in grassland mechanization are taken, you'll see them *first* at your New Holland dealer's.

New Holland Machine Company Division of Sperry Rand Corporation, New Holland, Pennsylvania.

**NEW HOLLAND**

First in Grassland Farming